





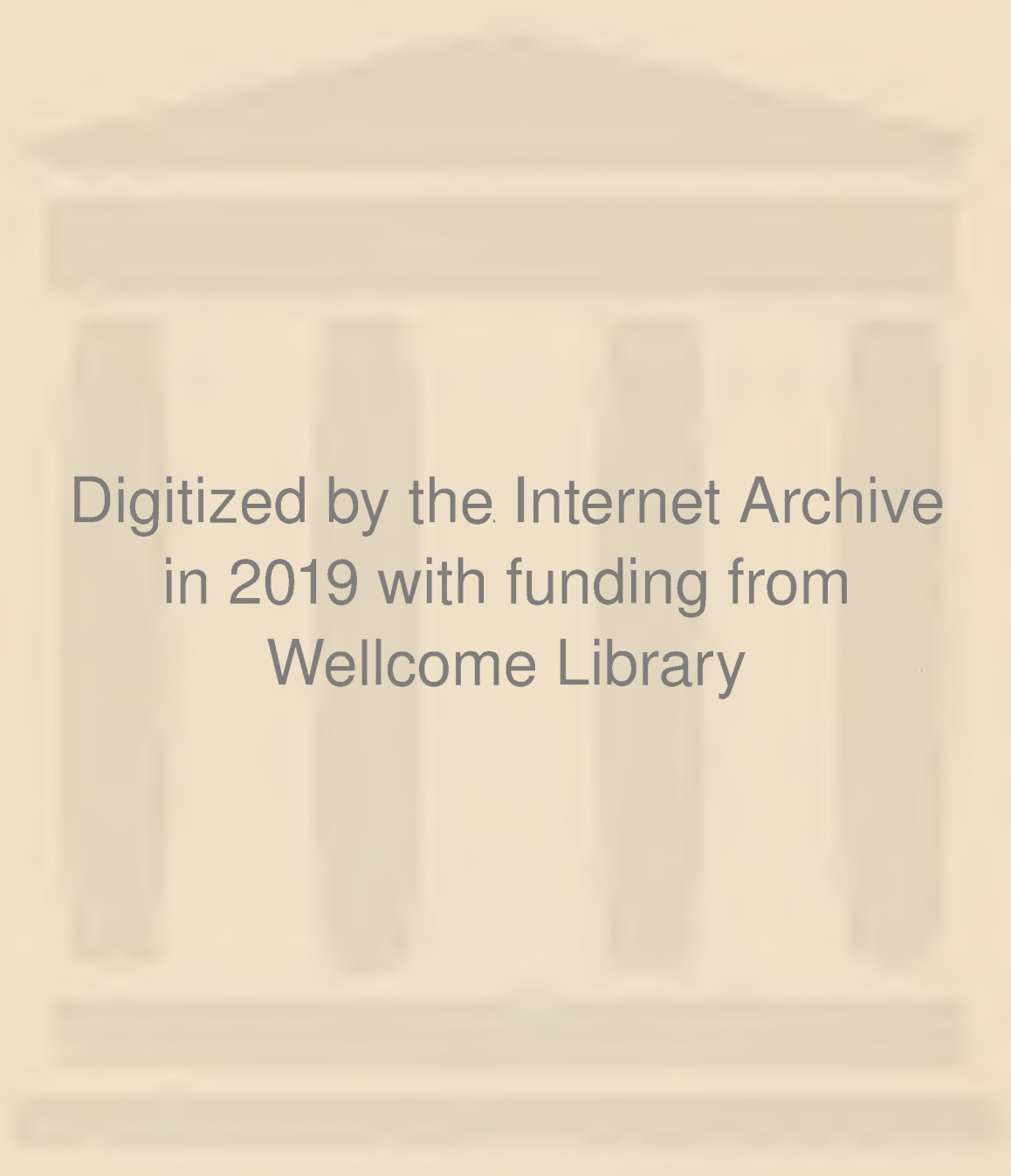
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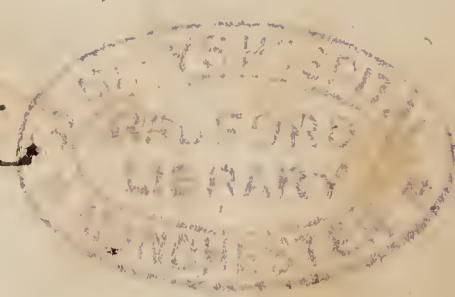
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THE  
M E D I C A L  
AND  
C H I R U R G I C A L  
R E V I E W ;



CONTAINING

A COPIOUS ACCOUNT

*Lying-In* OF THE *Hospital.*  
VARIOUS PUBLICATIONS

IN DIFFERENT LANGUAGES,

ON

M E D I C I N E A N D S U R G E R Y .

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VOL. II.

From MAY 1795, to MAY 1796.

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quæ non fecimus ipsi  
vix ea nostra voco ——— OVID.

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LONDON:

Printed for the EDITORS; and sold by T. BOOSEY, Broad-street;  
G. MUDIE, Edinburgh; and W. GILBERT, Dublin.

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1796.







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## P R E F A C E.

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ON concluding the Second Volume of the MEDICAL AND CHIRURGICAL REVIEW, the Editors beg leave to return their acknowledgments to the Faculty, for the support it has experienced. Success, they flatter themselves, is some indication of the utility of the Work they have undertaken. Their industry will be exerted to render the future Numbers worthy of the Patronage the former have received.

Their particular thanks are due, for the Accounts of some valuable Foreign Publications, which they have been favoured with by Correspondents. The difficulty of procuring these is great, from the continuance of causes which



have before been noticed. Further communications of this kind, therefore, will be thankfully received.

The Editors are obliged to state, that they cannot receive Author's Accounts of their own Works, unless they confine themselves strictly to an Analysis of their contents. Criticism is only a secondary object in this Publication, and an impartial estimate of merit will hardly be expected from Writers themselves.



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THE  
MEDICAL and CHIRURGICAL  
REVIEW.

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For JULY 1795.

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ART. I.

*A Treatise on Cancers.* By Henry Fearon, Surgeon to the Surry Dispensary. 8vo. p. 230. a new Edition, price 3s. 6d. London, Johnson, 1795.

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THE former editions of this work were published so many years ago, that it is probably unknown to many of our readers, we presume therefore, that a brief account of it will not be unacceptable. The author sets out with describing the general appearances of Cancer, and the signs of distinction between this and other tumours which bear a resemblance to it. Concerning the causes of Cancer he does not think himself adequate to the attempt of clearly illustrating a subject so difficult and obscure. He is, however, inclined to consider inflammation as the proximate cause of the disease, and the practice which he has found most successful is founded on this supposition. He con-

siders Cancer as a local disease in its origin, becoming constitutional in a secondary way only, by absorption; he is of course an advocate for early extirpation.

Rejecting internal remedies, as inefficient in the treatment of Cancer, the author recommends, in the early stages of the complaint, a method of practice founded on his idea of the inflammatory nature of the disease; this is, bleeding, either topical, or general, according to the seat of the complaint or part affected.

“ In the beginning of scirrhus affections of the breast and testis, the mode I have adopted of taking away blood, is by leeches repeatedly applied to the parts. In this course, however, I have often been interrupted by the topical inflammation, produced by these animals, around the parts where they fastened. In delicate female habits, I have often lost a week before I could proceed to the re-application of them. When the symptoms lead me to suspect the stomach, uterus, or any of the viscera, to be so affected, that the complaint either is, or most probably soon will become cancerous, I then have recourse to general bleedings. But whether topical or general, perseverance for a sufficient length of time is necessary. Though the pulse never indicated such practice, yet the patients have not suffered by repeated bleedings; on the contrary, when they passed a certain time of losing blood, they felt a return of their symptoms, and of their own accord desired to be bled again. To this plan or practice of repeated bleedings, I joined a milk and vegetable diet, avoiding wine, spirits, and fermented liquors; an open belly, and saturnine applications.”

From



From the cases brought in proof of the utility of this plan we select the following.

Case 3. Elizabeth Robinson, being admitted a patient at the Surrey Dispensary, in April 1784, said she kept a coal-shed in Bermondsey-street; and that she had for six months been afflicted with a swelling and pain in her breast: that she heard it was cancerous, and desired my assistance. The tumor was incomprehensibly hard to the touch, and gave her very acute pain, after being handled; the nipple was contracted, and the veins of the skin varicous; the lancinating and darting pains encreased with the disease. Being perfectly satisfied that it was a true scirrhus, I put her under a course of cicuta in as large quantities as she could possibly bear, guarding against its narcotic effects, and applying the *Aq. Veg. Min.* externally. By these means and a proper regimen being observed, she thought herself relieved for a time; but at the end of eight weeks, not receiving a cure, she became tired of my prescriptions, gave up her letter of recommendation unknown to me, and I heard no more of her for two months, when she returned and gave me the following account; viz. She had been informed, that the gentlemen of the Westminster Infirmary were famous for the cure of cancerous complaints, that she had been two months under the care of Mr. Justamond, without experiencing much relief, and therefore was returned to submit to whatever I thought proper. I immediately took her under my care, put her upon a milk and vegetable diet, and ordered four leaches to be applied every second day. This plan soon produced a diminution of the size of the disease, pain, and all its concomitant

symptoms ; and in nine weeks she returned thanks to Mr. Johnson, the Governor who recommended her, being perfectly cured. From the loss of blood she became very thin and pale, insomuch that her acquaintance apprehended she was become consumptive, and advised her not to lose any more blood. But the uncommon benefit she experienced, induced her to persevere, and she soon recovered her health and vigor, which she has enjoyed without the least interruption ever since.

“ In a conversation with Mr. Justamond upon this case, he candidly acknowledged he had given the martial flowers and corrosive sublimate, without the wished-for success.

“ Case 4. I was consulted by Mr. ———, aged fifty-one, for a scirrhus of the testicle which had been two years forming, during which time, the size, weight and pain, had considerably encreased. The spermatic chord was a little thickened and the testicle hard and considerably enlarged. The darting pains were so frequent at times as to deprive him of his natural rest. The case having been suspected to be venereal, he had been put under a well-conducted course of mercury for five weeks, which only encreased his complaints. Being an inhabitant of Colchester, sea-bathing was fully and fairly tried without the least good effect, on the supposition that his disease was scrophulous.

“ On his application to me, I did not entertain a doubt concerning the nature of his complaint, and therefore ordered ten ounces of blood from the arm, and leeches to be applied to the part at least thrice a week. To this I joined an abstemious regimen, and  
kept



kept his body open. This plan was continued only ten weeks (during which time he was occasionally seen by Mr. Hamilton, Mr. Beal, an India surgeon, and Mr. Day of Colchester) when he was perfectly cured."

When the means above recommended fail, the author advises immediate recourse to be had to extirpation. His mode of performance consists, in dissecting away all the diseased part, through one simple incision, large enough to admit of its perfect removal, and then bringing the edges of the wound into contact, and retaining them in that situation by stripes of sticking plaster, ligature, or both if necessary, till they unite by what is called the first intention, which they generally do in a few days, without ever going into suppuration. Several cases are related where this mode of operating was pursued with success.

Several years having elapsed since the first publication of this work, an opportunity has been afforded to estimate the advantages that might accrue from the improvement suggested by the author. From our own observation, therefore, and from general experience, it appears, that the repeated application of leeches to scirrhus tumours in their incipient stages, has often put a stop to the progress of the disease, and in some instances a subsidence of the tumour has followed. The method of operating by preserving, as much as possible, the common integuments, was first insisted on, we believe, by Mr. Fearon, and is undoubtedly a great improvement in practice. It is now pretty generally followed.

## II.

*A General view of the Establishment of Physic as a Science in England, by the Incorporation of the College of Physicians, London: together with an Inquiry into the Nature of that Incorporation; in which it is demonstrated, that the Exclusion of all Physicians, except the Graduates of Oxford and Cambridge, from the Corporate Privileges of the College, is founded in Usurpation, being contrary to the Letter and Spirit of its Charter. By Samuel Ferris, M. D. F. S. A. &c. 8vo. 168 pages, price 3s. 6d. London, 1795. Johnson.*

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THE exclusive privileges which the fellows of the College of Physicians have assumed, have repeatedly given rise to a contest between them, and the Licentiates, which has not always been conducted, on either side, with the greatest urbanity and liberality; nothing, however, has hitherto been gained by the latter in their struggle against, what they have called, the usurped authority of the College; nor have they, probably, any thing to hope for from the voluntary concession of that body. An appeal to a higher court appears the only way of obtaining that redress, which the members of the College are perhaps too much interested to grant of their own accord. We cannot better point out the object of the present publication, than by transcribing the author's address to his fellow-Licentiates.

“ The College of Physicians in London have a legal power, vested in them by Charter and by act of Parliament, to prohibit the practice of all physicians, within



within London and seven miles round, who have not been admitted to practise, by letters of the President and College under their common seal. The eligibility of a physician to be so admitted to practise, as specified in the Charter and in the subsequent act of the fourteenth and fifteenth of Henry VIII. depends upon his being ‘*doctus & probus*, or sad and discreete, groundly learned and deeply studied in physyke.

“ Eligibility, dependant upon such qualifications, could never be ascertained without previous examination. The test of eligibility, by examination, was appointed by act of parliament, to be given to the Bishop of London and Dean of St. Paul’s and four, approved physicians, before the College of Physicians was incorporated; and the necessity of examination is expressly stated in the Statutes of the College of the date 1607, the earliest that I have seen. It is therefore obvious, that the College, from their earliest existence, adopted the plan of examining every Candidate for admission, as to his competency as a medical practitioner.

“ By a succession of admitted members, the perpetuity of the established College was to be maintained; and the President and College were authorized to make bye-laws for the *wholesome* government, supervising, and correction of the said College, and of *all men* practising physic, in London and seven miles round. Long after the College was incorporated, the medical practice of the surgeons and the apothecaries was under the controul of the admitted physicians.’

It

• It has never been directed, either by the Charter, or by any act of Parliament, in what manner the College were to examine the physicians, whom they admitted; it consequently follows, that their forms of examination, and of subsequent admission, have been prescribed only in their statutes or bye-laws.

“ A particular knowledge of the history of any incorporated society, is, certainly, not a requisite qualification for admission to its fellowship. As Licentiates of the College of Physicians, we may all, perhaps, on a retrospect of our examination and admission to practise, avow our total ignorance, at that time, of the bye-laws, under which the College conducted the one, or granted the other. The bye-laws of the College are not published so as to be purchased, they are now neither presented to the Licentiates, nor read to them. To bind men to the observance of laws, with which they have not the means of becoming acquainted, is incongruous to every idea of rational and impartial jurisdiction.

“ I have ever considered this conduct in the College of Physicians, with a distrust of its motive, and have as often contemplated, with astonishment, the wide difference of privileges and rank possessed by the Fellows of the College and the Licentiates. I have neither observed the appearance of greater abilities, nor of maturer judgment, in my intercourse with the former than with the latter. Their public productions have not, oftener, displayed either general learning or professional knowledge. The Licentiates have been as industrious as the Fellows of the College, in the pursuit of all useful information. They are as conversant in polite literature. They have studied  
under



under the same medical professors with many Fellows of the College, and have possessed all the advantages of attending the same hospitals.

“ Considering these circumstances I was confident, that not any superiority of claim was to be conceded to the Fellows of the College, under the presumption of exclusive excellence, or of pre-eminent abilities: but my curiosity was not, till lately, excited to investigate the source of so conspicuous a distinction, among the examined, approved, and admitted physicians of this metropolis and its vicinity: a distinction so degrading to the character of every Licentiate.

“ In prosecuting the inquiry it was readily discoverable, that the College, when they framed their statutes relating to the admission of members, had lost sight of all ‘ due consideration of the design and intention of the Crown and Parliament in their institution.’ They have generally established such statutes upon an arbitrary principle; in consequence of which, every Licentiate, when admitted to practise, has been directed to subscribe to a declaration of his own comparative ignorance. For he is constrained to receive a license under a bye-law, which declares his incompetency to become a member of the College; whilst the Graduates of Oxford or Cambridge, or those, who have been incorporated there, are considered exclusively entitled to *apply* for admission into the corporation.

“ The demanded testimony of professional capacity and acquirements is, nevertheless, essentially the same for the license and the fellowship. If it were not so, the Censors would violate their oath to the College,

and their obligation to the public, by a flagrant breach of an important trust; because the right of practising is as unlimited with the Licentiates as with the Fellows, and it is as requisite to investigate their qualifications. There has been introduced, indeed, of late years, for the sake of a colourable distinction, a trifling difference in the form of examining the candidates for the fellowship. But the Licentiates have been denied the very right of undergoing this form of examination for equal privileges.

“ In the printed copy of the College statutes, of 1785, there is but one form of examination for the Candidates and Licentiates. It was not until after the absurd and riotous contest, in 1787, of some of the Licentiates into the College gates, that any actual difference was established in the examination of the candidates. The first regular admission of a Fellow of the College, after that period, was in 1773, and the new form required the candidates, as a proof of the knowledge of the Greek language, to render into Latin, during their examination, some passages from the writings of Hippocrates and Galen; and to illustrate them by a short comment.

“ There is not any material objection to the requiring such a proof of the learning of any physician, who is solicitous of the privileges of the corporation. But if to translate from Greek into Latin, with a concise comment, the writings of Hippocrates and Galen, or of Aratæus, or of any other Greek author, be the ultimate test of medical erudition exacted from their candidates, by the College of Physicians, why are not all men equally entitled to admission, who are equally competent to that test? Let the ex-  
acted



acted proofs of learning and of professional capacity be what they may, the sole question is, and the only inquiry ought to be, whether those, who apply to be admitted, are, or are not, adequate to the established probation ?

“ If among yourselves, Gentlemen, who are debarred from the highest privileges of the faculty of physic, there be physicians, who are in reality, as well qualified, in all respects, as the *allowed* candidates for the fellowship of the College ; can they possibly conceive, that their exclusion is not arbitrary and oppressive ? Will they be diverted from that opinion by discovering, that, in the very act of accepting their license, they unknowingly subscribed to the reproachful imputation of self-inferiority ? and that, by doing so, they were betrayed into an apparent acknowledgement of the justness of a distinction, which disparages their abilities, and depreciates their merits, in comparison with men of neither better understanding, nor of higher acquirements than themselves ?

“ To exact from any man, that which it is dishonourable to execute, is an example of tyranny, which but ill accords with the notion of a refined age ; for the ideas of progressive refinement and of the gradual abandonment of vulgar prepossessions, are inseparably associated in the mind. Among those to whom the concession of rank is admitted to be just, upon a presumption of their superior attainments, mankind are irresistibly led to expect men, with minds enlightened by science, who, in the acquirement of extensive knowledge, have learned to temper their judgment with moderation, and to free their

decisions from prejudice ; men, who, in the conduct of life, disdain the low principles, which actuate the illiterate.

“ If it be urged, that there really are, among the present Fellows of the College of Physicians, men of this description ; men, whose literary acquirements reflect dignity on their professional character ; if it be granted, that there are, among them, men, whose gentlemanly conduct and suavity of manners, in private life, conciliate more than the common esteem of those who have the pleasure of their acquaintance ; how is it to be reconciled, that, in their corporate capacity, they infringe every sentiment of liberality, by the narrowest and most pertinacious adherence to the principles of corporation monopoly ? Even, in their admission of Licentiates to the Fellowship *speciali gratia*, has their selection been determined by a generous attention to extraordinary merit ? Has it not rather been governed by a partial recommendation, and frequently accompanied by such humiliating conditions, that, in the manner of conceding, they have cancelled all the favour of the concession, and obliterated even that semblance of honour, which might, otherwise, have graced the acceptance ?

“ A Greek examination is, or is not, requisite for ascertaining the competency of candidates for the Fellowship of the College : if it be unnecessary, the sole intention of establishing it must have been to create an invidious distinction, between the ostensible learning of Graduates of the English and of other Universities. If it be in reality essential, the partial recommendation, alone, of a President, or of any other man, however high in professional consequence

is



is not an adequate proof of proper qualification to be admitted to the Fellowship. As little is it a proof of ingenuofness of mind to oppose the admiffion of men, who have already given every requifite proof of competency in professional knowledge, and who follicit the eftablifhed test of claffical erudition. Such an influence of recommendation is incompatible with the fundamental principle of the incorporated College; fuch an oppofition betrays a want of candour and confiftency.

“ It might reasonably have been expected, that, when the College abrogated their ftatutes, which excluded aliens, who are legally incapacitated for the offices of the Corporation, they would have abolifhed thofe, likewise, which exclude Britifh Phyficians. It would have fhown a ftronger attachment to the obligation of their trust, than to the influence of partial interceffion. Complimentary compliance, from interest or perfonal favour, is a violation of duty in the exercife of offices of public confidence; and what elfe, but a compliment, can it be reckoned, to concede the honours of the College to thofe, whom the laws of the land interdict from executing any of the official functions of the Fellowship?

“ After deliberate investigation, I am thoroughly perfuaded, that the College of Phyficians never had authority, legally conceded to them, to refufe the corporate privileges of the College to any Phyfician, wherefoever he might have been educated, provided he were competent, by the law of the land, to execute offices of civil trust, and were found, upon examination, *fatis doctus et probus*.

“ It

“ It has been my endeavour, Gentlemen, to give you a clear and candid view of this question. I cannot have any interest in perverting your judgment. You must observe that I have been, as Dr. Goodall formerly declared himself to have been, in vindication of the College, ‘ forced to adventure upon the exercise of more faculties than one, and to meddle in matters of law as well as of physic.’ It was the opinion of Junius, that ‘ to investigate a question of law demands some labour and attention, though very little genius or sagacity.’ It may be, perhaps, allowable to shield myself, under the authority of so able and perspicacious a writer, from the charge of temerity and presumption for attempting this. My utmost vanity, Gentlemen, could never so obscure my judgment, as to induce me to fancy any display of genius or sagacity in the inquiry, which I address to you: yet I may acknowledge that my labour has not been inconsiderable, nor my attention cursory. If, nevertheless, a too implicit confidence in the truth of my argument, have betrayed me into a too firm reliance upon untenable conclusions, I am open to conviction, and should be more gratified to see those conclusions candidly refuted, than I could possibly be in the enjoyment of the highest advantages obtainable upon the ground of error. Under all circumstances, I trust myself secure in your favourable opinion of my motives for the attempt. To those, whose peculiar studies enable them to form a better judgment of the subject, some apology is, certainly due.

“ You have all been apprized, Gentlemen, that an Address has been sent to the College of Physicians,



ficians, requesting admission for others to the Fellowship, under the same examinations as those, under which the Graduates of Oxford and Cambridge are admitted. Such an answer, as was due to such an address, such an answer, as they were indisputably entitled to, with whose signatures that address was presented, might have rendered this obtrusion, upon the public notice, of their grounds of claim, unnecessary.

“ That decorous respect from man to man, which is the chief characteristic of civilized society, and that reciprocal observance of becoming ceremony, which is the surest defence of relative rank, are seldom invaded, except from a proud reliance upon a fancied superiority of intellectual accomplishment, or a dubious security of power. It is impossible that the genuine dignity of the College of Physicians can be more highly regarded, than by those who signed that address, to which the College have not deigned to reply: there are not any more averse, than they, from contention among professional men: there are not any more reluctant, from principle, to commence litigation. ‘ Our application arose, (as expressed in our address) from no hasty project, or restless spirit of innovation, It was meant to advance a claim, which, we are well warranted to believe, is founded both in law and equity.’ A widely different idea, however, has been inculcated. Malevolence has attributed to our zeal a democratical and levelling spirit; but the rectitude of our intentions, and the moderation of our conduct will appear, when all such malignant aspersions shall be contemplated as  
the

the mean subterfuge of stubborn usurpation, to evade the force of argument against assumed power.

“ Whatever zeal I myself have exerted upon the occasion, if it wore the appearance of such a spirit, it would falsify its principle. Not any man can be more indifferent, than myself, about the advantages derivable from the privileges contended for; but as there are others of our number, to whom the same consciousness of right imparts a stronger solicitude to obtain it, I should have thought myself unjustifiable, upon the ground of personal indifference, in withholding my attention from the subject, or in disavowing my concern for the event.

“ I know, Gentlemen, that exclusion from the corporate privileges of the College cannot affect all of us equally. There are many of our number so long inured to the oppression, as to have become insensible of its consequences. Others, independent in circumstances, are regardless of professional advancement; and both may be disposed to exclaim, ‘*et nos ergo manum ferulæ subduximus*,’ reluctant to submit again to the ordeal of an examination, of which their long establishment and character preclude every pretext of the necessity. But if there be among our number those, who, although they have undergone every material examination, which is ever demanded from the Graduates of Oxford and Cambridge, are willing to submit themselves again to the test of inquiry, and to demand probation legally, according to the form for the Candidates and Fellows of the College; shall the principle of our common right be abandoned, and those, who are eager to assert it, be left to struggle for themselves? Will  
you



you not ask yourselves, under what liberal or rational idea, under what possible pretence, that has the appearance of benefit to mankind for its object, can such men be denied the right of an examination as Candidates for the Fellowship of the College, and however qualified, be excluded from all the advantages of admission? I have declared myself interested only in the establishment of the general right derivable from the charter; and I persuade myself that every man among you, of an independent mind, will feel a similar impulse of duty to assist in the general cause, if he be satisfied that it is a just one. Should he be indifferent about the advantages for himself, he may promote the good of others, to whose advancement in life they might largely contribute, and who would embrace the opportunities, that might result from a mutual exertion, who, however, act under the firmest conviction that, ‘*Ea animi elatio, quæ cernitur in periculis et laboribus, si justitia vacat, pugnatque non pro salute communi, sed pro suis commodis, in vitio est.*”

The work consists chiefly of extracts from the different Acts by which the privileges of the College have been granted, with the author's comments on the mode which the College have adopted in their exercise of them. There appear sufficient grounds for concluding, that the College have, in many of their bye-laws, infringed on the spirit of their charter, to the oppression of many practitioners, who have at least equalled their own members, in all the necessary qualifications of the medical character. It is at the same time notorious, that they have suffered to pass unnoticed, the most shameless impositions of quack-

ery, and thus have unquestionably defeated one very important purpose, for which they were first incorporated.

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### III.

*Lettre de M. Iberti à un de ses amis, &c.* A Letter from M. Iberti to one of his Friends, on Animal Electricity.

*Esprit des Journaux, March 1794.*

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ALTHOUGH the works we are now to notice on the subject of Animal Electricity, made their appearance before the commencement of our journal, we trust the interesting nature of the subject, and the utility of giving a complete view of it, as far as it has yet been carried, will be a sufficient excuse for our taking it up at this late period. The letter before us gives a general view of the experiments which had been made, and the inferences which had been thence deduced. ‘Before,’ says M. Iberti, ‘Philosophy had been enriched by the discoveries in animal electricity, the influence and action of the electric fluid on living bodies were well known. It was known that many persons were affected at the approach of a thunder storm, and often suffered violent agitations. A person I have been long acquainted with, is seized at these times with sickness at stomach, purging, and sometimes vomiting.’

“ The



“ The opinion of those, who believe that animal motions are produced by animal electricity, is a corollary drawn from a great number of experiments. We are indebted to M. Cotugno, a celebrated Anatomist at Naples, for our first ideas on this subject. It appears also, that a student at the University of Bologna, whilst dissecting a living mouse, when he touched the intercostal nerve with his scalpel, received a considerable shock in his hand. It was then imagined that nature possessed the means of accumulating and retaining electricity in some part of the body. M. Galvani, Professor of Anatomy at Bologna, to whom we owe many interesting discoveries on this matter, multiplied his experiments on living animals, and presents us with many new ideas on muscular motion.

“ One day he held in one hand by means of a hook, a frog, so placed a for the feet of the animal to touch a small silver basin; on touching by accident the basin with the other hand, he observed the whole body of the frog to be violently convulsed. These convulsions were renewed as often as he touched the basin; but if another person touched the same basin, no effect was produced. This experiment, repeated in a variety of ways, indicated a resemblance between the Leyden phial and the action of animal electricity. M. Galvani concluded that the same thing took place in each; that one kind of electricity, the condensed and positive, existed in the nerves, and the other in the muscles. This experiment gave rise to a number of others, by himself and M. Valli.

1. “ M. Valli laid bare the brachial nerve of a fowl; a few seconds after, he irritated the nerve and parts

which were exposed ; scarce any movement was excited : but when he armed the nerve with a bit of metal, and applied one point of a pair of scissars, which he used as a conductor, and with the other touched the muscles of the wing, from which he previously removed the integuments, violent contractions were excited.

2. “ He removed one wing of the fowl whilst alive, and having armed the brachial nerve with a piece of lead, the limb gave no signs of motion when irritated throughout, nor the nerve itself ; but if he applied one point of the scissars on the exposed muscles, and the other to the armed nerve, immediately convulsions were excited. The same phenomena took place in the thigh.

3. “ Having armed the crural nerve of a frog, he placed the two extremities of the limb detached from the body, on two plates of metal which were not in contact. The whole of the apparatus rested on a non-conducting substance ; then with a metallic conductor, he touched the plates, which supported the limb from which the integuments had been removed ; the limb was displaced by the violence of the agitation produced.

4. “ He next plunged the limb into two glasses of water, in such manner that the crural nerve armed, was immersed in one glass, and the foot in the other ; as soon as he touched the water with one hand, and with the other the armed part of the nerve with a piece of silver, the limb leaped from the water by the violence of the movement.

5. “ He formed a chain of several persons ; when the first touched the armature, and the last the  
water



water which was in the glass, containing the leg and foot, the member was violently agitated. It must be observed, that if the body of the frog is touched with a piece of metal, and the armature of the nerve with the finger, no motion is excited, for it is necessary that the armature should be touched with a piece of metal.

“ Amongst the experiments which M. Valli made at Paris, he tied the crural nerve of a living frog; the animal lost the power of motion in the parts below the ligature; but having armed the nerve, the contractions were produced when the communication was established between the muscles, and the part above the ligature: the phenomena, however, were much weakened.

“ Opium, applied to the armed nerves, generally destroys the vitality, and the action of electricity, on these parts; but the action of Opium is directed much more towards the origin of the nerves, than towards their extremities. Hence it happens that when these phenomena cease in the superior parts, they continue a much longer time in the inferior. Many Physicians are of opinion, founded on this interesting fact, that the principal seat of life in the nerves is at their extremities; for it is observed, that opium, applied to the cut extremity of a nerve, produces no diminution of the electric phenomena. We learn from an experiment made at London, that an extremity of a frog being immersed in a warm solution of opium, the part being afterwards subjected to experiment, seemed fatigued, and in less than a quarter of an hour, lost all appearance of electricity; on trying the experiment on the other limb of the same frog, without

without the application of opium, it gave signs of electricity for an hour and half. M. Valli introduced a solution of opium between the skin and muscles of the thigh of a frog, but the electricity suffered no alteration. He injected also the solution between the fibres of the triceps of a frog, that had been before immersed in opium, and it remained motionless. However in six instances, the result was different, and the opium neither weakened nor suspended the electricity.

“ It appears that muscular power depends in great measure on the electric fluid. Fishes, many of which are possessed of considerable sensibility, have a prodigious quantity of nerves, and many of them afford very strong marks of electricity, as the torpedo, the lamprey of the River Amazons, the eel of Cayenne, called *the Trembler*.\*

“ The analogy which is found between the effects of animal electricity, and the action of nerves on the irritable fibres of muscles, has led to a supposition, that the nervous fluid, which forms the basis of the prevailing systems in physiology, is nothing else but the electric fluid. M. Valli not only attributes to electricity the power of exciting irritability, and putting muscles into action, but also of communicating to them the immense force they are found to possess. We see persons in convulsions exert an almost incredible force. An analogy has been supposed between the power of muscles, and the attraction by which

\* It is said that the Abyssinians make use of the Torpedo for the cure of fevers. They tie the patient on his back, on a table, and apply the fish to all parts of the body. The operation is attended with extreme torture, but they pretend that it carries off the disease.



which two electrified surfaces are brought together. It has been remarked also, that frogs, in which the brain has been removed or crushed, shewed no signs of electricity after a few minutes.

“ Animals which after death have been deprived of electricity grow soon putrid. Those which die of hunger or gangrene, give very weak signs of electricity.

“ It appears, that animals killed by immersion in hydrogen gas, and in carbonic acid gas, have shewn marks of electricity. It appears, likewise, that many other poisons produce no alteration in the phenomena of animal electricity. When the brain is armed, effects follow analogous to those which are produced by arming the nerves; which has been supposed to afford a proof of the brain being a reservoir or condenser of electricity. If the conductor is placed on the kidneys, lungs, or spleen, and the nerve is afterwards touched, the same phenomena appear. On making the experiment in a contrary direction, the signs of electricity shew themselves in a direction from below upwards, but they may appear in every direction.

“ It has been supposed also, that the nerves contain another fluid, which is the vehicle of electricity. After having armed a nerve, and apparently exhausted the electricity in the corresponding limb, if the arming is removed, and placed higher upon the same nerve, the phenomena again take place; which has given occasion to a belief, that it is not the electricity itself which has been exhausted, but merely the vehicle.

M. Galvani

“ M. Galvani observed, that different metals produced different effects. If the plate, hook, and thread employed were all of iron, the appearances were very weak, and sometimes imperceptible. But if one of the substances was of copper, or, which is still better, of silver, the contractions were performed with much greater force, and for a longer space of time. M. Berlinghieri, however, believes that it is not necessary the metals should be different which serve for armatures and exciters, as he has observed the effects follow on the application of iron or steel alone; but it must be remarked, that the effects have in this case soon ceased; and on changing one of the metals, they have again been renewed with their former force.

“ When a live frog is laid on a table, and a piece of lead is laid on the belly, and a piece of silver under the pelvis, and a communication is made between the two metals, by means of a conductor, very strong convulsions are excited; but the same experiment does not succeed on man: yet the experiments of M. Volta, present us with a fact somewhat analogous; if a piece of silver is placed underneath the tongue, and a piece of tin over the tongue, on bringing them into contact, a remarkable saline taste is perceived. M. Valli has excited motions by arming muscles instead of nerves.”



## IV.

*Experiments and Observations relative to the Influence lately discovered by M. Galvani, and commonly called Animal Electricity.* By Richard Fowler. 8vo. 176 pages. 3s. 6d. Johnson, London, 1793.

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MR. FOWLER commences his work by inquiring, if the phenomena, exhibited by the application of certain different metals to animals, be referrible to electricity? He observes, that the whole train of circumstances, which preceded this discovery, had a tendency to occasion a belief of its relation to electricity. Accordingly M. M. Galvani and Valli both adopted the opinion of the identity of their cause. A repetition of some of the experiments excited the doubts of the author, as to the legitimacy of the conclusion which had been drawn. His first object was to ascertain, as well the various circumstances which are essentially requisite to the production of these phenomena, as those in which they can be rendered most obvious. After a great variety of experiments, he found, that he could not excite in an animal the appearances described by Galvani, with any substances whatever, whether solid or fluid, except the metals: and that the mutual contact of two different metals with each other, was in every case necessary to the effect. In estimating the comparative powers of different metals as exciters, he found zinc by far the most efficacious, especially when in contact with gold, silver, molybdena,

dena, steel, or copper, although these latter excite but feeble contractions when in contact only with each other. Next to zinc, tinfoil and lead appear to be the best excitors. When the bulk of the metals is large, and the quantity of surface of an animal with which they are in contact, is considerable, the contractions are both stronger, and more readily excited.

Notwithstanding the analogy this influence bears to electricity appears, from almost all the experiments, exceedingly strong, yet the author entertains considerable doubts of their identity.

“ In order” he observes, “ to accumulate artificial electricity, if I may be allowed the use of such an expression, it seems necessary, that there should be motion between two substances, an electric and a conductor. But, neither motion nor electrics have any share in the production of that influence which occasions the phenomena in question. The motion, here, is the effect, and not the cause of the accumulation: and instead of one conducting substance of any kind whatever, two metallic substances seem indispensably requisite.

“ That influence, whatever it be, which is possessed by the torpedo, &c. seems to depend entirely upon the will of those animals, both for its production, and management, as appears not only from the retraction of their eyes within their sockets, whenever they mean to give a shock, but, likewise, from each shock being increased, diminished, or withheld, as they are irritated or aware of some obstacle to its transmission. But the will of an animal has no share in the production of the phenomena discovered by Galvani.

“ In



“ In the scale of conductors of electricity, charcoal holds a higher place than the fluids of animal bodies, and ice than the metallic salts. But of the influence in question, I have found animal fluids, and metallic salts, excellent conductors, at the same time that I have never observed it pass through charcoal, or even dried wood. I have, likewise, reason to believe that it does not pass through ice. Ice, indeed, is but a very imperfect conductor of electricity, when free from air bubbles, and when the experiments with it are made in a very low degree of temperature. Yet we are told by Mr. Achard, that it will conduct electricity, even when Reaumur's Thermometer stands at 6 degrees below 0.

“ But the temperature of the room, in which I made my experiments, was at least 55 degrees above 0, by Fahrenheit's scale. I may likewise remind the reader of the experiment, in which the abdomen of a frog was filled with mercury, and a rod of silver passed through it to the sciatic nerves. A piece of zinc, touching both mercury and silver, excited no contractions; whereas most vigorous ones were excited when water was substituted for the mercury. A proof, as I take it, that water is a much better conductor of this influence than mercury: but of electricity, mercury is deemed a better conductor than water.

We are told by Mr. Cavendish, that Mr. Walsh found the shock of the torpedo would not pass through a small brass chain: but the influence discovered by Galvani, passes, without sensible diminution of its effects, through a small brass chain of several inches in length, when it is drawn so tight as to bring its links into close contact with each other: and it passes

through a gold chain when held between two persons, and suffered to hang with a considerable bend. Yet, if we may be allowed to judge of the comparative strength of the two influences, by the effects which they produce upon animals, that of the torpedo must certainly be allowed to be the strongest; and I see no other way of accounting for its finding an insuperable obstacle to its transmission, where the other finds scarcely any, except by supposing that they are in reality different in their nature.

“ Dr. Valli tells us, that he observed the hairs of a mouse, attached to the nerves of frogs by the tin-foil, with which he surrounded them, alternately attracted, and repelled by each other, whenever another metal was so applied as to excite contractions in the frogs.

“ This experiment I have many times repeated, both in the manner described by the Dr. and with every variation in the disposition of the hairs which I could devise: but whether they were placed upon the metals, the nerves, or the muscles, or upon all at the same time, neither I, nor my friends who assisted me, have in any instance been able to observe them agitated in the slightest degree.

“ I have made similar experiments upon a dog, and upon a large and lively skate, by disposing, in the same way that I did the hairs of a mouse, flakes of the finest flax, swansdown, and gold leaf; but although the contractions produced in the skate, by the contact of the metals, were so strong as to make the animal bound from the table, not the least appearance of electricity was indicated.”

Mr. Fowler made several experiments for the purpose of ascertaining whether this new influence acted immediately



immediately on the muscular fibre; but in this case a doubt must always remain, whether the muscular fibre has been completely separated from the nervous: he therefore made a trial on animals, which are generally supposed to be destitute of nerves, such as earthworms and leeches. On laying these upon a crown-piece of silver, placed in the middle of a large plate of zinc, when the animal stretched its mouth beyond the silver, and came in contact with the zinc, it instantly recoiled, as if in acute pain. The author however, does not so much consider this as a proof of the muscular fibre being acted upon immediately, as of these animals having nerves, although not discoverable by the eye.

He next inquires if all the nerves of the body are equally subject to this influence, or if its effects are confined to those appropriated to voluntary motion. The experiment with tin-foil and silver did not succeed: but having dissected away the pericardium from a frog's heart, which had an hour before ceased spontaneously to contract, he removed the muscles and cellular membrane covering its nerves and large blood vessels. He then placed one end of a rod of pure silver in contact with one side of these nerves and blood vessels, and one end of a rod of zinc on the other, both of them at about the distance of the third part of an inch from the auricle of the heart. On bringing the opposite ends of these rods into contact, the auricle first, and then the ventricle of the heart immediately contracted, and repeated their contractions as often as the metals were made to touch each other.

The author tried if it were possible to transmit this influence from the mother to the foetus, through the medium of the umbilical cord; the experiment was made on a female cat, far gone with young, but without effect.

On laying bare the crural artery of a frog, arming it, and applying the different metals, no contraction was produced in any muscle of the limb.

The author supposed that this influence might afford a means of investigating the source from which the respective powers of nerves, and of muscles, are derived, and made several experiments with this view. He found that the division of the blood vessels of a limb, destroyed its susceptibility sooner than the destruction of communication of the nerves with the brain. He also found that the susceptibility was increased, by an increased action of the vessels, as when inflammation was excited in the limb on which the experiment was tried.

A very different effect is produced by applying the metals to the brain or spinal marrow of frogs, from what is produced by applying them to their nerves. In the latter case, he has observed, that every muscle to which a nerve below the part touched is distributed, is brought into instant contraction. But no muscles are brought into contraction, when the metals are applied to the brain or spinal marrow, except such as derive their nerves from the part immediately in contact with the metals. The influence does not stimulate or pass along the spinal marrow, as it would pass along the trunk of a nerve, to affect all other nerves branching off from it.



The result of all the experiments leads the author to conclude, that the influence, discovered by Galvani, has no relation whatever to electricity.

The following curious experiments were communicated to the author in a letter from Mr. Robinson, Professor of Natural Philosophy in the University of Edinburgh.

“ 1. I find, that if a piece of zinc be applied to the tongue, and be in contact with a piece of silver, which touches any part of the lining of the mouth, nostrils, ear, urethra, or anus, the sensation resembling taste is felt on the tongue. If the experiment be inverted, by applying the silver to the tongue, the irritation produced by the zinc is not sensible, except in the mouth and the urethra, and is very slight. I find the irritation by the zinc strongest when the contact is very slight, and confined to a narrow space, and when the contact of the silver is very extensive, as when the tongue is applied to the cavity of a silver spoon. When the zinc touches in an extensive surface, the irritation produced by a narrow contact of the silver is very distinct, especially on the upper side of the tongue, and along its margin. This irritation seems to be mere pungency, without any resemblance to taste, and it leaves a lasting impression, like that made by caustic alkali.

“ 2. If the zinc (finely polished) be applied to the ball of the eye, the brightness of the flash seems to correspond with the surface of the contact, of the silver with the tongue, palate, fauces or cheek. The same thing happens when the silver is applied to the eye.

“ 3. When

“ 3. When a rod of zinc, and one of silver are applied to the roof of the mouth, as far back as possible, the irritations produced, by bringing their outer ends into contact, are very strong, and that by the zinc resembles taste, in the same manner as when applied to the tongue.

“ 4. I had been paring my toe nails with scissars, and had cut off a considerable portion of the thick skin, so that the blood began to ooze through, in the middle of the wound. I applied the zinc there, and an extensive surface of silver to the tongue. Every time I brought the metals into contact, I felt a very smart irritation by the zinc at the wound.

“ 5. I made a piece of zinc having a sharp point, projecting laterally from its end. I applied this point to a hole in the tooth, which has sometimes ached a little, and applied the silver in an extensive surface to the inside of the cheek. When the metals were brought into contact, I felt a very smart and painful twitch in the tooth, perfectly resembling a twitch of the tooth-ach. I thought this a double twitch, and that one of them happened before the metals came into absolute contact. I am now almost convinced, that this is the case, for when I make the silver rest on a dry tooth, without touching the tongue or fauces, I have no twitch on bringing the outer ends of the metals together: showing that there is not a proper communication through a dry tooth. If, while the outer ends remain in contact, I touch the silver with the tip of the tongue, still no twitch is felt in the tooth. If I now separate the outer ends of the metals, keeping the tongue applied to the silver, a slight twitch is felt in the moment of separation, and  
a strong



a strong double twitch when they are again brought into contact. N. B. This twitch is prevented, by allowing the tongue or lip to touch any part of the zinc.

“ 6. I had a number of pieces of zinc made of the size of a shilling, and made them up into a rouleau, with as many shillings. I find that this alternation, in some circumstances, increases considerably the irritation, and expect, on some such principle, to produce a still greater increase. If the side of the rouleau be applied to the tongue, so that all the pieces are touched by it, the irritation is very strong and disagreeable. This explains what I have often observed, the strong taste of soldered seams of metal. I can now perceive seams in brass and copper vessels by the tongue, which the eye cannot discover, and can distinguish the base mixtures which abound in gold and silver trinkets.

“ I find that common silver thread makes a very good conductor, and this to any distance.

“ Since writing the above, I have found a very easy way of producing very sensible convulsions, (I think muscular) and corroborating my opinion, that the communication (of this part of the whole effect) takes place before contact.

“ Put a plate of zinc into one cheek, and a plate of silver, (a crown-piece) into the other, at a little distance from each. Apply the cheeks to them as extensively as possible. Thrust in a rod of zinc between the zinc and the cheek, and a rod of silver between the silver and the other cheek. Bring their outer ends slowly into contact, and a smart convulsive twitch will be felt in the parts of the gums situ-

ated between them, accompanied by bright flashes in the eyes. And these will be distinctly perceived before contact, and a second time on separating the ends of the rods, or when they have again attained what may be called the striking distance. If the rods be alternated, no effect whatever is produced.

“ Care must be taken not to press the pieces hard to the gums; this either hinders us from perceiving the convulsion, or prevents it. I find too, that one rod, whether zinc or silver, is sufficient for the communication, and even bringing the two pieces together, will do as well, or perhaps better. But the rods are easier in the management.”

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## V

*Experiments on the Nervous System, with Opium and Metalline Substances; made chiefly with the View of determining the Nature and Effects of Animal Electricity.* By Alexander Monro. M. D. Professor of Medicine, Anatomy, and Surgery, in the University of Edinburgh, &c. 4to. Pages 43. Price 3s. Johnson. London, 1793.

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IN noticing the present publication at this period of time, we have at least one advantage; that of bringing the whole of the subject into one view; and as the conclusions which have been drawn by different persons in the prosecution of their inquiries, are of  
consider-



considerable importance, and as these conclusions have very materially differed, it was perhaps of consequence that they should be so presented. The reader will perceive, that the experiments conducted by the learned professor, have led him to inferences very remote from those which had been drawn by former writers.

In the first place we have some observations on the circulating and nervous systems of frogs.

“ Their heart consists of one auricle and one ventricle only, their aorta supplying their air vesicles, or lungs, as well as all their other organs; and, of course, their venæ cavæ return the blood from all parts to the heart. The ventricle of their heart contracts about sixty times in a minute; and the purple colour of the blood which is seen within it, disappears after each contraction, or the blood is entirely expelled by its contraction. For upwards of an hour after cutting out its heart, a frog can crawl or jump; and, for upwards of half an hour longer, it contracts its legs when the toes are hurt, though not with sufficient force to move its body from the place where it is laid.

“ Their encephalon consists of brain and cerebellum, each of which, on its upper part, is divided into two hemispheres; and, below, they are conjoined by thick crura, which form the medulla oblongata and spinal marrow, both of which are proportionally larger than in man, and more evidently consist of two cords. There are nine true vertebræ; and at the sixth of these, the spinal marrow terminates in the cauda equina. The sciatic nerves are formed by three pairs of nerves, sent out below the seventh,

eighth and ninth vertebræ, and by one pair from the os sacrum. A nerve, resembling our great sympathetic nerve, passes downwards from the abdomen into the pelvis.

“ Two days after cutting off the head of a frog at its joining with the first vertebra, I found it sitting with its legs drawn up, in their usual posture; and when its toes were hurt, it jumped with very considerable force. Its heart likewise continued to beat about forty times in a minute, and so strongly as to empty itself and circulate the blood.

“ In several frogs, after cutting off the back part of the sixth undermost true vertebræ, I took out all that part of the spinal marrow with the cauda equina which they cover. The lower extremities were rendered insensible to common injuries, and lay motionless; yet the frogs lived several months thereafter, and the wounded parts on their backs cicatrised; and the bones of their legs, which I fractured, were re-united, the blood circulating freely in their vessels.

“ It is universally known, that if, after amputating the limb of a warm blooded animal, we repeatedly irritate the nerves which terminate in muscles, repeated convulsions of the muscles are for some time produced; and that in frogs, and other cold blooded animals, the nerves retain this power still longer.

“ But it has been commonly supposed, that after irritating the nerve a given number of times, the effect ceases, authors conceiving that there is lodged in the nerve some fluid, or other energy which is exhausted by repeated explosions. Instead of this, I have found that the time the nerves preserve their power is the same, whether we irritate them or not;

or



or that their energy is not exhausted by irritation, unless the irritation be such as sensibly alters their texture."

The author next relates his experiments with opium, These experiments were made with various circumstances, as injecting an infusion of opium under the cranium, and along the course of the spinal canal; in the cavity of the abdomen; after the heart had been removed; after a division of the principal nerves, &c. from them all, he deduces as corollaries the following:

1. " That the frog, after its head is cut off, feels pain, and, in consequence of feeling, moves its body and limbs. .

2. " As the nerves of the hind legs are not affected by Animal Electricity, unless it be applied lower than the fifth vertebra, these nerves do not seem to be derived solely or chiefly from the brain or cerebellum.

3. " As opium, after the circulation ceases, affects organs distant from those to which it is applied, it is beyond doubt, that the latter suffer in consequence of sympathy of nerves.

4. " It appears that, in this animal, there is sympathy of nerves after the head is cut off; or that sympathy of nerves does not, in this animal, depend entirely on the connection of nerves within the head.

5. " As, after cutting off the head, this animal is susceptible of pain, and, in consequence of that, performs voluntary motion, it appears that, in it, the brain is not the sole seat of the *Sensorium Commune*.

6. " Several weeks after I had taken out the lowermost half of the spinal marrow, and with it the Cauda Equina, I daily applied, for four days running,  
Animal

Animal Electricity to the sciatic nerves, by passing a gold probe between them and the os sacrum, and excited several hundreds of convulsions of the thighs and legs, and yet found that, on laying bare the femoral nerves, and pinching them, the muscles were slightly convulsed.

“ Hence, I apprehend, additional force is given to an opinion I ventured many years ago to propose, that the nerves do not receive their energy wholly from the head and spinal marrow, but that the texture of every branch of a nerve is such as to furnish it, or that the structure of each nerve is similar to that of the brain.

7. “ From the above experiment, it appears probable, in the highest degree, that opium may be absorbed in such quantity as to produce fatal symptoms.

8. “ The following circumstances concur in rendering inadmissible an opinion lately proposed by M. FONTANA, that poisons operate by changes they produce on the mass of blood, or on some unknown principle connected with the blood.

a. “ If his opinion was just, poison introduced into a vein of the extremities, so as to be in contact with this unknown principle, should operate as quickly, and in the same manner as when the poison is mixed with the blood near the heart, which he admits is not the case.

b. “ Cutting the spinal marrow in frogs, before applying the poison of the viper to their legs, prevents it from killing them; which should not happen, if the poison acted on the blood alone.

c. “ He acknowledges that an animal bit in its leg by a viper, instantaneously feels acute pain; and it, in like manner, feels instantly great uneasiness when  
the



the poison is mixed with its blood. We know for certain, that, through the medium of the nerves, we are instantly rendered sensible of injury done to the most distant parts of our bodies.

“ Are we not, therefore, in the last mentioned experiment, to conclude, that the uneasiness was produced because the poison acted upon the nerves of the vessels?

“ d. In like manner, animals were convulsed as soon as they were wounded, or received the poison into a blood-vessel; and long before the blood could have reached the muscles in action.

“ e. As soon as the distilled water of *Lauro-cerasus* was poured into the stomach of a pigeon, it was convulsed, and died instantly, that is, before the poison could have entered the mass of blood.

“ f. Many years ago, I found, after cutting the *venæ cavæ* and *aorta* of a frog, that a watery solution of opium poured into the heart, occasioned, in a few minutes, convulsions in its legs; and, after cutting out the heart, that the opium poured into the cavity of the abdomen affected the legs in like manner; although, in these experiments, the circulation was not only interrupted, but the greater part of the blood evacuated.

“ I therefore then concluded, and now conclude, that opium and other poisons, even after they are mixed with the mass of blood, produce their fatal effects, chiefly and almost solely, by acting on the nerves of the heart and vascular system, and through these, affecting the whole of the nervous system.”

The author then proceeds to state the several circumstances he has observed, in his experiments, which  
lead

lead us to judge of the nature and cause of Animal Electricity. The experiments are so concisely, although clearly, related, as not to admit of abridgement; we shall therefore, proceed to the summary of facts proved by them.

“ 1. On forming a circle by means of the parts of a living animal and of two different metallic bodies, especially gold and zinc, in contact with each other, if a nerve makes part of the circle, the muscles in which the nerve terminates are convulsed.

“ 2. Although the nerve making part of such a circle has been cut transversely, yet, if the divided parts of the nerve are laid in contact with each other, or tied together, the muscles, in which it naturally terminates, are convulsed.

“ 3. If the metals, composing parts of the circle, are kept steadily in contact with each other, the convulsions of the muscles cease. But, if they are separated from each other and again rejoined, the convulsions are repeated.

“ 4. The effects are the same, although the dead parts of an animal or pure water make parts of the circle.

“ 5. Although the dead parts of an animal, making part of such a circle, are in contact with the metals, the effects are the same.

“ 6. A muscle making part of such a circle may be convulsed whilst the matter put in motion is passing in the direction from the muscle to the nerve.

“ 7. The muscle may be convulsed although it makes no part of the circle in which the matter put in motion passes, as appears from comparing experiment 5th with experiments 13th and 14th. From experiment



periment 13th, it appears, that the fluid put in motion by the metals passes readily along a nerve, after it has been cut, providing the divided parts of it are brought into contact with each other. Yet in experiment 14th, in which the left hand of the Operator was not applied to the foot of the frog, the muscles in which the nerve, lower than the ligature, terminated, were not convulsed, because the fluid put in motion did not descend lower than the place at which the gold probe touched the nerve above the ligature. We may therefore presume that when a nerve which has not been cut, as in experiment 5th, is touched with the gold probe, the fluid put in motion does not pass lower in the nerve than the place of the probe. Hence we perceive the error of those who suppose that the moisture on the surface of the nerve conducts the fluid put in motion to the muscles, and that their action is in consequence of the direct operation of this fluid upon their fibres.

“ 8. The effects are the same when the animal and metals are insulated, by being placed on glass, whilst sealing wax is interposed between the hand of the operator and the metals.

“ 9. If any part of the circle is composed of sealing-wax or glass, the muscles are not convulsed.

“ 10. Convulsions are not excited unless the metals are in contact with each other: and unless both metals are also in contact with the animal substances or the water making part of the circle.”

The great resemblance the facts above stated bear to electricity, must strike every one.

Like the electrical fluid, this influence communicates the sense of pungency to the tongue.

Like the electrical fluid, it is conveyed readily by water, blood, the bodies of animals, the metals; and is arrested in its course by glass, sealing wax, &c.

It passes, with similar rapidity, through the bodies of animals.

Like the electrical fluid, it excites the activity of the vessels of a living animal, as the pain it gives and hemorrhagy it produces seem to prove. Hence perhaps it might be employed with advantage in Amenorrhœa.

It excites convulsions of the muscles in the same manner, and with the same effects as electricity.

When the metals and animal are kept steadily in contact with each other, the convulsions cease, or an equilibrium seems to be produced, as after discharging a Leyden phial.

Dr. Monro, therefore, concludes that the nervous fluid, or energy, is not the same with the electrical, or with the fluid which is put in motion by the above-mentioned experiments, from the following considerations.

“ 1. Without stating the difficulty there is in conceiving how the electrical fluid can be accumulated by or confined within our nervous system, we may observe that where the electrical fluid, or fluid resembling that put in motion by the foregoing experiments, is accumulated by an animal, such as the Torpedo or Gymnotus, a proper apparatus is given to the animal, by means of which it is enabled to collect and to discharge this fluid.

“ 2. The nervous power is excited by chemical or by mechanical stimuli; and on the other hand, is destroyed by opium and other poisons, which cannot be imagined to act on the electrical fluid.



“ I have, I apprehend, refuted the theory of Doctors Galvani, Valli and others, which supposes that the nerve is electrified *plus* and the muscle *minus*, resembling the Leyden phial, by shewing that the muscles are convulsed where there is no communication between them and the metals, but by the medium of the nerve; or when the metals are applied to different parts of the nerve alone, without touching the muscles which are convulsed, and when the muscle which is convulsed makes no part of the circle in which the matter that is put in motion passes.

“ 4. I have proved, that the muscles are convulsed whilst the current of the electrical matter is passing from them and from the smaller branches of the nerves into their trunks; and as a muscle is never thrown into action by the nervous energy, except when this passes from the trunk of the nerve into its branches, and from these into the muscle, it appears that when, in these experiments, the muscles, were convulsed, the nervous and the electrical fluids were moving in opposite directions; from which we may infer, that, in their nature, they differ essentially from each other.

“ 5. The nervous energy is stopped by a tight ligature or by the transverse incision of a nerve, although its divided parts are thereafter placed in contact with each other; whereas the electrical fluid or the fluid excited by the metals, passes readily, downwards or upwards, along a nerve which has been tied or cut.

“ 6. After the limb of a living animal has been amputated, frequent convulsions of the same muscles may be excited by applying mechanical or chemical stimuli to its nerves; whereas electrical matter discharges itself suddenly.

“ Hence

Hence Dr. Monro concludes.

1. That the fluid, which, on the application of metalline bodies to animals, occasions convulsions of their muscles, is electrical, or resembles greatly the electrical fluid.

2. That this fluid does not operate directly on the muscular fibres, but merely by the medium of their nerves.

3. That this fluid and the nervous fluid or energy are not the same, but differ essentially in their nature.

4. That this fluid acts merely as a stimulus to the nervous fluid or energy.

5. That these experiments have merely shown a new mode of exciting the nervous fluid or energy, without throwing any farther or direct light on the nature of this fluid or energy.

## VI.

*The Physicians' Vade Mecum; being a Compendium of Nosology and Therapeutics, for the Use of Students.*  
By the Rev. Joseph Townsend, 12mo. 130 pages.  
3s. London, Cox, 1794.

THE utility of classical distinctions in diseases may well be doubted, notwithstanding the high opinion entertained of them by the author of the present collection. It is hardly too much to say, that all attempts of this kind which have hitherto been made, so far from facilitating the acquirement of knowledge



knowledge which might be useful to the young practitioner at his outset, by biasing his mind to particular systems, which have no foundation in nature, have prevented his observing the true character of diseases, a knowledge which cannot be taught by words, and thus have materially retarded his progress in true medical science. Every one must feel the difficulty, and often the impossibility, of referring the diseases which daily occur, to any particular arrangement he can find in books, however well instructed he may be in school knowledge. What can more strongly prove the falsity of systems of Nosology and their consequent inutility? They have been supposed to render the study of medicine more easy, by their methodical arrangement. But that the teaching doctrines, which are unfounded, and which must again be unlearned, can be useful, is a problem which it would be difficult to solve. It is certain, that the study of medicine conducted in this way, qualifies a man to harangue eloquently on the subject; enables him to assign proximate causes, and appropriate methods of cure; but it is a fact likewise, that this dogmatism and clearness of distinction decrease in an exact ratio with the acquirement of real knowledge by actual observation of nature. A slight acquaintance with diseases, as they really appear, serves to convince every discerning practitioner, how little he has really learnt from books, and how much he finds himself at a loss in putting his theories to the test of experiment. Whether a book therefore, of the kind before us, can be of any real use to the student in medicine, may well be questioned.

It consists of the genera and species, arranged according to Cullen, with a translation of the characters into English. Part the second is a compendium of Therapeutics, compiled from Duncan, Whytt, Elliot, and Berkenhout: to which are added various formulæ in each class. There are besides a General Index, and Explanation of Terms.

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## VII.

*Medical and Chemical Essays.* By Thomas Trotter, M. D. Physician to his Majesty's Fleet under the command of Admiral Earl Howe. 8vo. 155 pages. 3s. 6d. Jordan, London, 1795.

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DR. TROTTER was amongst the first to apply the new discoveries in Pneumatic Chemistry, to the science and practice of medicine. In the second edition of his Observations on the Scurvy, he attributes this disease to the abstraction of oxygene from the blood, occasioned by a deficiency of recent vegetable matter. Since the publication of his Theory, he has made such experiments as had been suggested by different physicians. They have not, he remarks, added to our list of antiscorbutics. His recent practice has not tended to weaken any of his former arguments; on the contrary, he has reason to think they



they have gained fresh support. Dr. Beddoes\* thought the author incorrect in attributing scurvy to the want of fresh vegetables *alone*; he supposed the impure atmosphere they breathed between decks, having less of the respirable quality, might become a cause of the disease. Dr. Trotter, however, from observation, is of opinion, that this is not the case, nor do seamen in general breathe a more impure air, than people in other circumstances.

The situation the author held in the year 1793, in the *Vengeance*, during a voyage to the West-Indies, afforded him the best opportunities of investigating the nature and cure of scurvy. The experiments he here relates, were made while the ship was at sea, and when no fresh vegetables could be procured. The good effects of the citric acid, or juice of lemons, were, in all instances, most clear, and almost infallible. As this remedy was supposed to operate, by imparting oxygene to the blood, Dr. Beddoes thought, the sulphuric and other acids, would probably produce equally good effects. The experiments of Dr. Trotter go to determine this point. His first trials were with

#### DILUTED SULPHURIC ACID.

“ Robert Bell, aged thirty, a seaman, and was impressed: his symptoms of scurvy were spongy gums, hardened and contracted hams, livid spots on the thighs and legs; very much depressed in spirits, and apprehensive. He is to take the vitriolic acid, diluted with water, in as great quantities as his stomach  
and

\* Observations on Calculus, Sea Scurvy, &c.

and bowels will bear, without pain. This medicine was continued for a week, during which time the symptoms became gradually worse. It was then changed for the juice of limes, which in a few days effectually cured him.

“ For a day or two at first Bell had better spirits, and looked more lively; but it did not continue. The effect of lime juice was, as I have generally observed, apparent in twenty-four hours. Five cases of nearly the same description followed the above; the result was exactly the same.

#### CONCENTRATED ACID OF TARTAR.

First day. William Casey, aged twenty-four, a landman. Symptoms of scurvy are lameness, contracted tendons of the knee joint, large livid spots on the legs and thighs, difficulty of breathing, great dejection of spirits, &c. He had the fever sometime ago, and went through a course of mercury for the venereal disease, in the passage out. In a note, in my book, under this man's case, is the following remark. ‘ This man is a very fit subject for experiment, as all my fruits are now expended.’ The ship at this time was cruizing off Guadeloupe; for had I been in a situation to command limes or lemons, I should not have thought myself justified in making comparative trials of any articles in this man's complaints. Patients affected like him will often drop from our hands when we very little expect it.

“ He is to take a pint of water, to which is to be added, concentrated acid of tartar, sufficient to give it the usual acidity. What I mean by the usual acidity, is enough to endanger gripes in the bowels, without



without however effecting them. This has always been the only rule adopted in exhibiting the citric acid. Two drams of the concentrated acid of tartar give a sharp taste, if well prepared, to a pint of water,

“ Second day. Complains less of pain, and appears in better spirits than yesterday.

“ Third day. No change for the better: complains much of pain and weariness.—Let the quantity of acid be increased.

“ Fourth day. No variation from yesterday.

“ Fifth day. Feels no relief from the medicine, is scarcely able to walk.

“ Sixth day. No apparent symptoms of recovery. This day the ship came to Dominica, where the fruit, and vegetables that were with difficulty procured soon recruited the health of this man and others.

“ Another case, though not so inveterate as Casey's, was treated at this time in the same way, and was similar in its issue.

#### NITRE.

“ First day. The subject of the last case, William Casey, about five weeks from the time he was cured as above, was affected with scurvy in a manner almost like his former symptoms.

“ The ship was now on her passage to England, but from the very short time that was given us to prepare for the voyage, it was not in my power to procure either fruits or vegetables for the use of the sick, in sufficient quantity.

“ This man was ordered to take two drams of nitre very well diluted throughout the twenty-four hours.

“ Second day. No better.

“ Third day. Says he is rather worse.—Let the quantity of nitre be increased.

“ Fourth day. Scorbutic symptoms evidently gaining ground.

“ Fifth day. Limbs more swelled, and the knee joint more hard and contracted; livid spots growing of darker colour. Let him take the nitre for one day more.

“ Sixth day. All symptoms worse; pains all over him, and worst when in bed.

#### ACETOUS ACID.

“ Seventh day. Let him take eight ounces of vinegar diluted with water, in the course of a day.

“ Eighth day. Has taken half a pint of vinegar since yesterday, without gripes.—Says his legs are harder and stiffer.

“ Ninth day. Says he is easier as to pain; but no appearance of being better. Found that I had been giving him vinegar, in consequence of which he took a full pint more, which he got from different messes; it being at this time served to the ship's company.

“ Tenth day. The quantity of vinegar taken a pint and a half, yet he feels no effect from it.

“ Eleventh day. Thinks he is easier, but no external symptoms of it. He now takes a quart of vinegar.

“ Twelfth day. Much worse to day, in all his symptoms of scurvy. Quantity of vinegar the same

as



as yesterday, but does not affect his bowels. He is to continue it one day longer.

#### SUGAR.

“ Thirteenth day. Says he is always worst in the morning, and got up to day much more fatigued than when he went to bed. His teeth are growing loose; the knee is very much contracted and black. Let him take eight ounces of good soft sugar in the day.

“ Fourteenth day. Much the same; not purged by the sugar; let him take ten ounces to-day.

“ Fifteenth day. Getting worse; let the sugar be tried for only one day more.

“ Sixteenth day. No better. Let him now take two ounces of lime juice in the day. The weather feels cold at this time, about the middle of September, from a northerly wind. My stock of lime juice now consisted of seven bottles, and about one hundred and fifty limes; I could not therefore give a larger dose, as other cases were appearing. This man recovered, but there was a necessity of increasing the acid.

“ A case or two more were treated with nitre and vinegar, and another with sugar, in the above quantity. The symptoms during their use seemed to grow as quickly as if no medicine had been given.

#### SPRUCE BEER.

“ First day. Richard Williams, a young man. Had the fever some time ago, but is grown remarkably fat. He is cook's-mate, and was accustomed to make free with the slush tub. Slush is the fat of the salt meat, skimmed from the water that boils it.

At my request it was forbid to the ship's company on leaving England. In this man, as is usual in all corpulent habits the scurvy advanced quickly, and the symptoms are peculiar. His looks have much of the dull bloated appearance, with a greenish hue round the eye and mouth. He is extremely averse to motion; the legs are much swelled, pitting on pressure, and rather red than livid.

“ Let him take a pint of spruce beer three times a-day. The officers had some at this time of the best quality.

“ Second day. No change for the better; appears quite in a state of indifference.

“ Third day. Rather worse: he is to take the spruce beer only one day more. It is too severe a case to carry farther.

“ Fourth day. Still worse. His teeth are now loosening, and nearly dropping from the jaw; gums very black and spongy: his spirits are very depressed, he thinks himself dying. Let him take the lime juice in as large doses as it can be spared.

“ Fifth day. He already feels relief. In the space of a week, he became emaciated, was very weak, but the scorbutic symptoms yielded in due time.

#### ACID OF TARTAR.

“ First day. John Hufsey, a landman. His symptoms are lassitude and debility, swellings of the lower extremities, yellow and livid blotches in the inferior part of his thighs, bloated countenance, foetid breath, spongy gums, teeth loosened, &c. Let him take the acid of tartar diluted.

“ Second



“ Second day. No alteration; no griping or purging from the medicine. Let him have, besides, a pint of porter in the day.

“ Third day. Symptoms worse, pains more severe.

“ Fourth day. As before.

“ Fifth day. Scorbutic symptoms increasing. Let him have limes sparingly, as our list now increases.

“ He grew better, but was not cured till in port.

#### DILUTED SULPHURIC ACID.

“ First day. — Quinlan, a landman, complains of the general scorbutic symptoms of some days standing, and is not able to walk. He is to take the diluted sulphuric acid. A pint of porter a day is likewise sent by the Captain to all the scorbutics.

“ Second day. Greater dejection of spirits, and looks ill.

“ Third day. Symptoms advancing rapidly. He is to continue the acid only one day more.

“ Fourth day. Has received no relief from the medicine. He is now to take the lime juice as it can be spared.

“ This man recovered slowly, and the disease more or less remained till we came to Spithead.

#### NITRE.

“ First day. James Harrington, a landman. His symptoms of scurvy are, great debility, lassitude, low spirits, hardness of the muscular parts of the legs, discoloration, &c. Let him take half an ounce of  
nitre,

nitre, very well diluted, in twenty-four hours; besides a pint of porter.

“ Second day. No alteration of the scorbutic symptoms, or feelings of the patient.

“ Third day. Thinks he is getting worse, and finds himself weaker; some slight degree of heat and pain about the pit of the stomach, from the medicine. Let it be continued only one day more.

“ Fourth day. Pain in the pit of the stomach, much the same as yesterday. No relief of the scorbutic symptoms; they are evidently gaining ground. Let him be treated as the others.”

The appointment of the author to the Haflar Hospital afterwards, gave him fresh opportunities of confirming his former observations.

Whether it be, that the pathology offered by Dr. Trotter is not correct, or the other acids are incapable of being decomposed in the system, and hence their inutility in scurvy, it is not perhaps easy to determine. Our theory here leaves us in the dark; a notable instance of the fallacy of reasoning *a priori* in medicine.

Subjoined to the author's observations on scurvy, we have a letter from Mr. Edward Laing, surgeon at New South Wales, which contains some observations tending to the confirmation of Dr. Trotter's opinion of the nature and treatment of the disease; together with some remarks on that colony, which do not appear of much importance.

The author observes, that he had been lately informed by Lieutenant Brown, that he had often seen potatoes given with great success in scurvy. This gentleman some time ago commanded a ship in the  
Southern



Southern Whale Fishery, where he found them of much benefit. His method of using the root was to cut it in thin slices, and to eat it as we do a cucumber, with pepper and vinegar. The juice of a raw potatoe, in taste very much resembles that of some of our worst winter apples. It possesses a considerable degree of acidity, and very quickly oxydates iron.

We are next presented with a case of a Blue Boy, who died at Haflar Hospital in the year 1794 with the appearances on dissection. He had been always subject to a difficulty in breathing. The singular circumstance in this case was an unusually livid or purple colour of his face, neck, and hands, and in some degree of the whole body. It ended in dropsy of the chest and general anasarca. There were found large concretions about the size of a pullet's egg in the right auricle, which was greatly distended. This substance appeared like rennet, or the dressed sweetbread of a calf, and had two or three small cavities. In the right ventricle were found two vesicles like hydatids, near the opening of the pulmonary artery.

The concluding essay contains thoughts on the decomposition of water, and a method for preparing casks to preserve it at sea. These observations were originally communicated to the society for the encouragement of arts, manufactures, and commerce, and published in their memoirs. The ideas here suggested are founded on the new theory of the composition of water.

“ On opening the bung of a cask where the water stinks, a volatile elastic vapour is immediately set at liberty; a putrid smell is perceived, and if a lighted candle comes in contact with it, it takes fire. This elastic

elastic vapour is nothing but inflammable air, or the hydrogenous gas of the new nomenclature. The manner of its disengagement is shortly thus; the wood possesses a large proportion of carbonaceous matter, which attaches the oxygene of the water, and leaves the hydrogen free. Fixed air, or carbonic acid, is, therefore, constantly generated in a cask of stinking water; this is proved by adding a little quicklime, which combines with the acid, and is thus reduced to its original state, limestone.

“ Now this description sufficiently shews the futility of former reasoning on the subject, and from it too we learn, that no substance added to the water, at least any that is yet known, can either preserve or recover it. The only method yet invented, is by exposing it to the atmosphere, as by the machine of Lieutenant Osbrige. This process also confirms our explanation, for the hydrogen is either dissipated, or attracts oxygene from the surrounding air to restore sweetness to the water.

“ Since we find,” continues the author, “ that an old cask preserves water better than a new one, it is more than probable, that what is called *seasoning*, is nothing more than exhausting the principle in the wood which favours the decomposition; and I am apt to believe, that by imitating this process there is a possibility of rendering wood equally fit for preserving the fluid sweet as porcelane, glass, or earthen ware.

“ For this purpose I would recommend the staves of the casks, when ready to be put together, to be steeped for a length of time in a pond filled with water; this ought to be allowed to stagnate so as to favour the decomposition of the water. The sooner  
therefore



therefore, the pool becomes putrid, and the longer time that the wood is immerfed in it, the more perfect will be the *seasoning*."

There were many instances during the late war, where fhips on foreign ftations, by having well feafoned casks, and having never been under the neceffity of unfrowing their holds, found the water pure and fweet as when they left Spithead. But unfeafoned new casks will fpoil the water in ten days or a fortnight. Oak casks have alfo, from the hardnefs of the wood, been preferred to all others.

In confequence of his firft letter, and an application to the Commiffioners of Victualling, the author obtained permiffion to make fuch experiments on the fubject as he thought requifite. His fecond letter to the fociety contains the refult of thefe.

In putting ftaves together, it is ufual to fire them, in order to form them into fhape. In converfation with the mafter cooper, he learnt, that a material difference had been obferved between a well fired cask, and one done in the common way, for preferving water. Several comparative experiments were made, with casks well blackened, and others, in the common degree. In about a fortnight the common casks became tainted and difcoloured; while the well-fired casks had the water not only fweet, but perfectly tranfparent. The author now fuggested, that the ftaves fhould be fired ftill more, even till a black *charry* furface was formed over the whole, and that the heads fhould be done in the fame manner. A number of puncheons and fome leagers were finifhed in this way and filled with water. The water continued limpid and fweet after many months. The charry furface

therefore appears to act as a coat of varnish or plaster, or as any other substance would, in defending the water from the wood. The application of this principle to various other purposes is obvious.

Some experiments of M. Lowitz of Petersburg, which have been lately related, seemed to show a direct power in charcoal of preventing putrefaction, and of correcting it when it has taken place. On several trials by Dr. T. this was not found to be the case. Powdered charcoal neither prevented the putrefaction of water; nor, when added to stinking water, did it in any degree correct the offensive smell or taste.

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### VIII.

*Engravings, explaining the Anatomy of the Bones, Muscles, and Joints.* By John Bell, Surgeon. 4to. 191 Pages. 28 Plates. Price 1l. 1s. Boards. London, Robinsons, 1794.

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OF a work of this kind, consisting almost entirely of tables and descriptions, little more can be given than a general character. The author observes, that in general, in anatomical figures, more attention has been paid to the beauty of the drawing, than to the accuracy of the representation. He observes, likewise, that an author has frequently written his book after his own way; and taken his plates, perhaps, where he is directed by his bookseller, or where



where he may most safely steal; and often chusing them of a fashion fifty years older than that book, into the gaps and interstices of which, they are to be nitched and stuck up, wherever they will make the handsomest figure, not where they will be of the most use.

This ironical praise may be very safely given to the older anatomists for their love of original drawings, that having once set their taste to one certain system of plates, they have been very constant and true to their first choice. It is thus that the plates of Vesalius, Fallopius, or Eustachius, have descended, with some distortions and abridgements indeed, but still unpolluted with any stain of originality, nor vitiated by any one improvement of representation or of thought, through the books of Vidus Vidius, Pareus, Stephanus, Blanchardus, Vesslingius, Riolanus, Verhein, Palsin, Dionis, and a thousand others. Thus have the once beautiful plates of Vesalius, (mangled and deformed, cut down to suit books of all sizes, twisted and accommodated to all subjects and all forms of explanation) descended to us in such distorted shapes, that while we are looking over their books to fix upon them the indictment of plagiarism, we can hardly recognise the original drawings so fairly as to prove the deed.

We have no doubt that these plates, if not beautiful as drawings, are yet entitled to the higher praise, in a work of this kind, of accuracy of representation. "I have drawn," says the author, "my plates with my own hand. I have engraved some of these plates, and etched almost the whole of them: which I mention only to shew that they have their chance

of being correct in the anatomy, and that whatever, by my interference, they may have lost in elegance, they have gained, I hope, in truth and accuracy.—And while I mention this, I must not be ungrateful to Mr. Beugo, whose skill, will, I hope, be shewn on some higher occasion, and whose character must not be hurt by any thing that may be seen here; for wherever in these plates all is fair and clean, it is owing to his care; and those blots of execution which are not fairly covered, have not come through his correcting hand. Whatever he has done alone has been hurried, allowing no time for artful or laborious engraving, though still all that is here, I hope is correct and true.”

The descriptions which accompany the tables are clear and full. We transcribe the authors observations on the muscles of the face, which follow the anatomical description.

“ Thus we see in the dead body, those muscles which give form and character to the human countenance, lying all dead and flaccid. The mouth open, the lips loose and shrivelled; the angles of the mouth dropping down, the cheek sunk; and the eye also closed, and sunk down within its orbit.—All the countenance is deformed, and the traits of individual character or beauty, quite gone.—But still enough remains to explain to us what those are, upon which chiefly the interesting variety of expression and form depends. The occipito frontalis wrinkles the forehead: the corrugator supercilii knits the brows, the levatores labiorum lift up the lip, spread wide the nostrils, and open the mouth; the depressores labiorum depress the lip; the triangular muscles draw down  
the



the corners of the mouth; the zygomatic muscle distorts the cheek, and the orbicularis oris antagonises all these, and closes the mouth.—These muscles, while they are performing more important offices, also express the passions, and mark the countenance with traits never to be effaced, the true study of those who would be physiognomists; who talk but idly, when they speak of expression in those immoveable features, which are formed rather by the contour of a bone. ‘The sagacious forehead or œconomical nose,’ are the rhapsodies of an enthusiast, not the serious observations of a sedate man, studious of that subject, which is interesting above all others.

The shapes of the bones determine the general form of the face. One great muscle, the masseter, gives the rounding of the cheek, the rest are all delicate and moveable muscles; and the great characters of the face, center round the mouth and nostrils where these muscles converge. The lean and delicate face, gains in expression where the cheek is hollow, the angle of the mouth moveable, the lines strong; but in those who are bloated, the cheek is fuller, the lines obliterated, the delicate turnings of thought and feeling are lost, all but the more violent strains of passion are buried in the mass. The great lines of character, are the line of the zygomatic muscle, coming from above, and of the triangular muscle, coming from the chin; and the moving point towards which they all act, is the corner of the mouth. In chearful emotions the features rise all towards the eye, which becomes full and turgid. In the depressing passions the features sink, the eye is languid, and the whole countenance gets a thoughtful serious cast.

But

But still it is the corner of the mouth, that is the central point of all these changes.

The corners of the mouth are continually supported by the action of the levator, and of the zygomatic muscles; they are raised high in smiling, so as to form a dimple there. They are raised higher in laughter, so as to swell the cheek, wrinkle the eyelids, and compress the eye till tears begin to flow. And the corner of the mouth, which is thus raised in laughter, is distorted in pride, malice, hatred; is dilated and drawn backwards in rage; drops lower in grief, and in palsy falls quite down.

These movements round the angle of the mouth, are the chief indications in the face itself, while all other indications of passion, proceed rather from the general system. A healthy body, and chearful mind have the face full, the eye humid, the limbs braced, the whole body free, and light moving. In languid health, or under affliction and care, the face is pale, the eye cold, the whole body languid and relaxed; and so it is in passion, for the medical arrangement of the passions is nearly correct. There are two great classes of passions, the exciting and the depressing passions; in the exciting passions, as joy or anger, the heart beats high; the face is turgid; the eye prominent and sparkling; the muscles are tense; the limbs braced; the whole body is in a moveable, active, and highly excited state; but when the heart beats languid in grief, or palpitates with fear, the face becomes pale, the features sink, the limbs tremble, the whole frame is unbraced, cold, and unapt for motion; and from these general conditions of the system result all those other marks of passion,



passion, which accompany the changes of the face; for in grief, fear, disdain, the blood ebbs, and the face is pale, and the features sink; while in anger the face is red, the eye-brows corrugated, and the eye turgid and strained; but in rage, the whole muscular frame is strained towards the most violent action, the breath is retained, while the pulse beats high; and so the face becomes turgid, the eye is fiery and red, there is a grinding of the teeth, the angles of the mouth are strained backwards, the nostrils are raised and dilated, the buccinator, zygomatic, masseter, and temporal muscles are in violent action, which gives an angular and linear hardness to all the features; and saliva and foam proceed from the universal pressure upon all the glands.

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## IX.

*Procédé pour prevenir les Dangers et meme les Désagremens de l'Infection des Cadavres dans les Amphitheatres de Dissection.* Method of preventing the Danger of Infection from dead Bodies in Dissecting Rooms.

*La Médecine Eclairée, par M. Fourcroy.*

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THE frequency of accidents which arise from the source pointed out above every year is well known. Whatever care is taken to keep Anatomical Theatres clean and inoffensive, either by sprinkling

ling with vinegar, or by fumigations, these means are found very incapable of preventing the dangerous effects from a large mass of animal matter in a state of putrefaction. This enemy is the more terrible to anatomists, as the nature of these septic miasmata is very little known, and the conjectures which have been formed on the subject, have been all of them, more or less, wide of the truth. To oppose an impenetrable barrier to this destructive agent, whatever be its nature; to prevent its disastrous effects on those occupied by anatomical pursuits, and to destroy the germ of putrid, and frequently fatal diseases, which these miasmata occasion, is the object of this paper. The oxygenated muriatic acid affords us this shield against the poison of animal putrefaction. We have been led to its use, to fulfil this indication, by the effects it is found to produce on odours of all kinds. Aromatics, the acrid antiscorbutic, the poisonous narcotic, hepatic, and sulphureous odours, are all destroyed by this substance. It acts immediately on the odorous principle, alters its nature, and changes rapidly the order of its composition. Upon this ground it was supposed, that the oxygenated muriatic acid was capable of opposing the dangers from the miasma of putrefying bodies, and experience confirmed the supposition. The abdominal muscles of a subject for demonstration having been removed, and the cavity of the abdomen laid open, notwithstanding the contents were carefully removed, it was found to exhale a considerable putrefactive smell: care was taken to wash the whole internal surface with the liquid oxygenated muriatic acid, and immediately the odour was destroyed: the students that  
had



had quitted the body, soon resumed their situation, without being afterwards incommoded; they continued their dissection in the abdominal cavity, and in the chest, which was also washed with the same, for a much longer time than is usual, without perceiving any degree of fœtor. A mild and humid state of the air, during which the putrefaction of bodies is known to proceed very rapidly, produced little effect for the space of eight days, on the body which was sprinkled by the acid; whilst, in the same period, other bodies had acquired the highest degree of putrefaction. The muscles, the nerves, the vascular membranes, and all the other parts, continued firm, and without alteration. M. Fourcroy advises, that in bodies for dissection, the parts should be sprinkled as they are laid open. This method, which will preserve bodies for more than six weeks, taking care to repeat it from time to time, is easy to practice; it is only to wash the parts slightly with a sponge, dipped in the oxygenated muriatic acid. The head should be turned away at the time, to avoid the vapour of the acid.

## X

*Procédé pour durcir les Substances Animales, Molles, Pulpeuses ou Muqueuses, et pour faciliter les recherches anatomiques sur ces substances.* Method of hardening those animal substances which are soft, pulpy, or mucous, with the view of rendering easier anatomical researches into those substances.

(Ibid.)

ONE of the difficulties which present themselves in the dissection of parts which are soft and pulpy, such, for example, as the brain, cerebellum, medulla oblongata, and spinal marrow, is the want of firmness in their structure, and the consequent yielding of their particles to any impression. Their softness also renders them extremely liable to change by putrid decomposition; oftentimes, in a few hours, they becoming so putrid, as to make it impossible to determine their structure, nevertheless these parts, to be well understood, demand a long and attentive examination. Some anatomists have proposed that these parts should be made to undergo a degree of heat a little above 45 degrees of Reaumur's scale, to give them a more firm consistence; and in fact, the albuminous matter, which makes the basis of the cerebral and nervous pulp, is susceptible of this density from the impression of caloric: but this process is not sufficient for the anatomist. The soft fibres of these organs, are compressed together, and become less apparent, after having undergone this operation. M. Fourcroy thinks he has discovered a method, which



which is more advantageous than the former. Having observed that all animal substances, especially the skin, membranes, &c. became firm and compact, after being macerated for some hours in the liquid oxygenated muriatic acid, and that their fibres approached each other in a remarkable manner by the action of this acid, he steeped a human brain, for eight hours, in this liquid, he afterwards plunged it once or twice in fresh water, to wash off that portion of the acid which adhered to the surface. After this preparation, the substance of the brain became firm; it admitted of being cut readily by a scalpel, and its tissue was not disorganised by gentle pressure, as is generally the case with this organ. This process was as advantageous as the one before related; the brain thus prepared, preserved its whiteness and consistence for more than eight days, and did not go into a putrefactive state in near so short a time, as in ordinary circumstances.

The utility of this property of hardening and preserving animal substances, is not confined to the dissection of the cerebral and medullary pulp of man and the larger animals, it affords an advantage, hitherto unknown, for dissecting the soft and almost mucous flesh of most fishes, the glairy substance of worms, as snails, earth-worms, &c. The oxygenated muriatic acid therefore is of considerable importance in anatomical theatres.

## XI.

*Observations sur la decomposition du Tartrite de Potasse Antimoniè et du Muriate Mercuriel Corrosif, par quelques Substances Vegetales.* Observations on the decomposition of antimoniated Tartrite of Potash (*Emetic Tartar*), and of Corrosive Muriate of Mercury (*Corrosive Sublimate*), by some vegetable Substances. By M. Berthollet.

(Ibid.)

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M. BERTHOLLET observes, that he has been sometimes astonished at the quantity of the antimoniated tartrite of potash, which he has seen given, with the peruvian bark, in an opiate which is known under the name of the *Flemish Remedy*, without its producing any emetic effects. It appeared to him an interesting object, to determine the chemical action which two of the most powerful articles of the *materia medica*, exerted on each other.

He mixed an infusion of bark, prepared with a moderate degree of heat, that it might be transparent, with a solution of the emetic tartar; the mixture became immediately opaque, and a whitish sediment took place slowly, which became gradually of the colour of brick. The liquor which swam at the top lost all its bitterness.

The same experiment was tried with the infusion of rhubarb, of leaves of senna, and wild succory, all prepared with a gentle degree of heat; but the liquors remained transparent.

An



An infusion of gall-nuts decomposed the solution of emetic tartar, but much more slowly than the bark; the mixture indeed did not lose its transparency till after some time.

With similar infusions was mixed a solution of the corrosive sublimate; with the infusion of bark a deposit was speedily made, at first whitish, but which soon took on a deeper colour, than the oxyd of antimony; with the infusion of galls, a sediment took place more slowly, of a fawn colour, but which grew deeper. The other infusions shewed no action on the solution of sublimate.

From these experiments M. Berthollet concludes,  
1. That the infusion of bark may be given with success, when a person has taken too strong a dose of an emetic, or that the medicine has acted with too much violence, owing to some peculiarity of the patient.

2. That when we prescribe an emetic, with other medicines, there may be other substances, besides the bark, which may decompose it, and which may counteract, by that means, the views of the physician, but that rhubarb, senna, and wild succory, have not this property.

3. That as the bark decomposes the corrosive sublimate, they ought not to be given together.

4. That this property in the bark, may render it exceedingly useful in preventing the primary effects of the corrosive sublimate, when it has been taken as a poison, or when it produced unexpected effects.

It would be preferable to alkalis, which in decomposing this substance, leaves a precipitate which is itself exceedingly corrosive. It would likewise be preferable to alkalinized sulphur which has been proposed;

posed ; but which is very disagreeable to the taste, and leaves on its decomposition, an alkali uncombined.

In the decomposition of the mercurial muriate by the quinquina, a compound is formed of the bitter and colouring substance of the latter with the oxyd of mercury ; one part of the oxygene of this will excite a small degree of combustion in this substance, which occasions the increase of depth in the colour of the precipitate. This oxyd then must lose its causticity on two accounts ; 1st. because it is deprived of a part of its oxygene, and of that which was most disposed to quit it to produce a caustic effect on animal substances. 2d. because being in a state of combination, its affinities are destroyed, or at least are nearly exhausted on the subject with which it is in union.

These observations apply equally to the emetic tartar ; and here medical experience confirms the theory\* ; for, when united in large proportion, with the quinquina, it does not produce its ordinary effects, if it be well triturated with the bark.

Although the compound of oxyd of mercury with the bitter colouring substance of the quinquina does not possess any caustic powers, it is possible it may preserve its antisyphilitic virtue, of the cause of which we still are ignorant. Similar combinations may be easily made by mixing the nitrate of mercury with different vegetable infusions. M. Berthollet has tried this with the infusion of rhubarb, senna,  
bark,

\* M. Portal has made the same observation ; two physicians having been called to a patient, one proposed the bark, the other tartrite of antimony. These two substances having been employed at the same time, no emetic effect was produced.



bark, and wild succory, and has thus procured considerable precipitates. The liquor which swam on the top had lost, in great measure, its taste. These precipitates, well washed, may perhaps afford advantages superior to what have yet been discovered.

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## XII.

*Essai du Théorie sur l'Animalization et l'Assimilation des Alimens.* Essay on the Theory of Animalization, and Assimilation of Aliments. By M. Hallè.

(Ibid.)

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THE application of the new Theory of Chemistry to the animal œconomy, with a view to the explanation of its functions, affords scope for much ingenious speculation, and will ultimately tend, we trust, to the improvement of medical science. M. Hallè begins his Essay, by laying down some general principles and definitions.

1. *Animalization*, he observes, is the change of vegetable to animal substances. *Assimilation* is the passage of alimentary substances, whether animal or vegetable, to that state which renders them similar to the parts of which we are composed.

2. Nutrition supposes in the vegetable aliments animalization, and in alimentary substances in general assimilation.

3. The one and the other of these operations suppose in the alimentary substances, first, the analogies which

which render them susceptible of undergoing these changes; secondly, the differences which render these changes necessary.

FIRST ORDER OF FACTS, COMPREHENDING,

- A. *The analogies of our aliments with our bodies;*
- B. *The analogies of alimentary substances to each other;*
- C. *The known differences between the substances which form our aliments, and our bodies.*

4. The analogy is known: *a.* It exists between our solids, and the fluids which are called nutritious, that is to say, those in which alimentary substances are necessarily contained, and by the aid of which they are necessarily distributed to all parts of the body; *b.* an analogy exists equally between our aliments, and the fluids termed nutritious.

5. All the substances which compose our solids are really contained, in a state of dissolution, in the nutritious fluids which penetrate every part of the body. The blood is the common vehicle of these. This fact is too well known to need demonstration. The nature of the chyle and lymph is little known to us; but we know that the system of lacteals and lymphatic vessels communicates immediately with the sanguiferous system.

6. It is known at present, that the substances which constitute the solid parts of the body, and which are carried by our fluids, are all contained in our aliments. Animal aliment contains them already formed; in vegetable aliment they are contained in a state somewhat analogous.

7. Animal gluten or gelly is resembled by the vegetable gelly, either in a liquid form, as in the juices



juices of a multitude of fruits, or in a dry form as in grain, &c. which makes the general basis of our nourishment.

8. It is hardly doubted at present that the vegetable gluten, so well known to exist in the farinaceous part of grain, and found likewise in the substance of almost every herb, is absolutely of the same nature with the fibrous part of the blood, and muscular fibre.

9. Analogies equally striking may be traced between the other substances of which our bodies and our aliments are composed. But the gluten and fibrous parts are the principal, and those which form, in combination with calcareous phosphate, the general basis of our solids.

10. Besides, all these substances, differing in their exterior qualities, and in many of their properties, but analogous in respect to their nutritive qualities, resemble each other in this respect, as having all, as a basis, the same principle, namely, that which, by analysis by means of the nitrous acid, forms the *base of the oxalic acid*, and which is equally the base of all fermentable and nutritive substances.

11. Sugar, mucilages, farinaceous matter, the gelatinous and mucous juices of vegetables, the vegetable gluten, a great number of vegetable acids, and in like manner, all the animal mucilages, their gellies, their fibrous parts, their albuminous substances, the cheesy matter which milk affords, have all as a base this same substance, affording all, on analysis, the oxalic acid.

12. The analysis of the fatty oils do not give altogether the same result; they however belong to the class of nutritive substances, and are not without analogy to the base of these. What has hitherto

been learnt of the nature of this base, has made M. Lavoisier presume, that although there be not a perfect identity between it and the fatty oils, this arises only from some difference in combination, the nature of which he thinks he can nearly explain. He supposes that this base, as well as the oils, is formed of carbone and hydrogene, but each of them in the state of oxyd. The phenomena of the animal œconomy confirm the idea, in shewing, that these oils are capable of being changed into substances formed of this base.

13. The *hydro-carbonous oxyd* then is the point of resemblance between all those substances which are capable of affording nourishment to animal bodies; the differences which exist between them are attributable to a difference in combination.

14. It is demonstrated by modern chemists, and principally by M. Berthollet, that in all animal and vegetable nutritive substances, the oxalic base, without changing its nature, is combined especially with two different principles; one is *carbone*, the base of *carbonic acid*; the other *azote*, the base of mephitic or azotic gas.

In the present state of our knowledge respecting animal and vegetable analysis, we are obliged to confine ourselves to these two principal differences.

15. It must be observed, that those substances in which the common basis is united to a large proportion of carbone, with little or no azote, are also those which, in their spontaneous decomposition, give evident signs of acescency; and those, on the other hand, where the combination of this basis with azote is predominant, readily become alkalescent.

16. Cæteris



16. *Cæteris paribus*, carbone is combined in larger quantities with vegetable substances, and azote with animal.

17. Hence, when vegetable substances become animalized, and when our aliments, which are in general less animalized than our bodies, are assimilated to our own substance, we may say that the change which is then brought about, consists in great part in this, that their common base combines itself with a larger proportion of azote, and, on the contrary, that it loses a part of the carbone with which it was previously combined.

18. If now we reflect, that when, by analysis, we separate each of these principles from the common base to which they are united, the combinations into which they pass give birth almost constantly to elastic fluids, we readily perceive how much the consideration of these fluids, in the animal œconomy, ought to attract the attention of the physician, and how much it may facilitate the understanding the most important phenomena of the animal functions.

#### SECOND ORDER OF FACTS; COMPREHENDING,

A. *The Nature of the Elastic Fluids contained in the Alimentary Canal;*

B. *The Changes which the Air undergoes in Respiration;*

C. *The Alterations it undergoes from being in contact with the surface of the body.*

19. The atmospheric air enters into the alimentary canal along with our aliments; it enters into the lungs by means of respiration; and it is applied to the whole surface of the skin.

20. In these three kinds of contact the air undergoes changes, the nature of which it is difficult to determine, because our methods of analysing have not yet attained all the perfection which is necessary to dissipate all our doubts: we know little more than the results.

21. The only set of experiments which we have on the elastic fluids contained in the intestinal canal, has been given by M. Jurine. His experiments were made under different circumstances, and especially on an idiot, that died on a very cold night, when in perfect health. However difficult it be to judge from thence of the state of health, and however uncertain an analysis performed only by means of lime water, and nitrous gas, may be, the following are the results which he gives as most constant.

22. The elastic fluids contained in the intestinal canal, consist of vital air or oxygene gas, azotic gas, hydrogene gas, and carbonic acid gas.

23. The relative proportion of *oxygene gas* always diminishes progressively from the stomach to the large intestines.

The relative proportion of *azotic gas* augments progressively from the stomach to the large intestines.

The relative quantity of *hydrogene gas*, generally augments from the stomach to the small intestines, and diminish from these to the large intestines.

The proportion of *carbonic acid gas* is the most variable of all; but in the man dying suddenly, it was very considerable in the stomach; and very slight in the rest of the intestinal canal.

24. With regard to the lungs, the fluid which is discharged from them during expiration, is composed  
of



of oxygene gas, of azotic and carbonic acid gas, but in proportions different from that of the air inspired. The oxygene gas is diminished; the carbonic acid gas increased; and the proportion of azotic gas with respect to the oxygene, is greater than in the atmosphere.

25. If a person continues to respire the same air till it be exhausted, on depriving it of its carbonic acid gas by means of lime water, the oxygene gas continues to diminish; but according to the observation of M. Jurine, it happens at length that the augmentation of the proportion of the azotic gas is much superior to the quantity of carbonic acid expired.

26. If the same thing be done with regard to vital air alone (the purity of which, however, M. Jurine does not determine with sufficient precision), the carbonic acid expired preserves itself a much longer time in a large proportion, but at the end, on trial with the nitrous gas, it appears to indicate as above a portion of azotic gas greatly superior to the carbonic acid produced.

27. Whatever opinion may be formed with regard to these experiments, all chemists agree, that in respiration, the oxygene gas or vital air is employed in new combinations. The greater number think that a part at least is employed in the formation of carbonic acid; the same thing takes place in the analysis of vegetable and animal substances, with the carbone of which the oxygene combines itself. The more exact chemists, considering that the quantity of oxygene absorbed exceeds the quantity necessary for forming the carbonic acid, believe that another portion is employed

employed in the formation of water with the hydrogen which is at the same time discharged from the blood. M. Jurine thinks there is disengaged another gas besides carbonic acid, to wit, azotic gas; and, according to this hypothesis, one portion of the oxygen absorbed, would serve for this purpose, as we know happens in the analysis of animal matters.

The imperfection of the methods of analyzing hitherto employed, leave us in much uncertainty on this head.

28. Lastly, with respect to air which has been in contact with the skin, if we collect with M. Ingenhouz, that which remains adherent to the surface of the body, when we plunge into the water, we find it to be merely azotic gas: if we make an examination out of the water, of the air which has stagnated around the body, as M. Jurine, we find that this air contains carbonic acid, and that the proportion of oxygen gas is diminished; but these phenomena are not augmented in proportion to the time employed in the experiment. One may presume that the quantity of carbonic acid produced is greater in a current of air, which becomes continually renewed.

29. It remains demonstrated, after what has been said, that whether it be in the intestinal canal, in the lungs, in contact with the surface of the body, the atmospheric air undergoes certain changes; that the oxygen gas enters into new combinations; that new substances mix themselves with the air, and that the proportion between the azotic gas and the other constituent parts of the atmospheric air is altered.



CONSEQUENCES WHICH RESULT FROM A CONSIDERATION OF THE FACTS ABOVE STATED.

*Theory of the Assimilation of Aliments.*

30. In the analysis of animal and vegetable substances, the separation of their common base from carbone and azote is brought about principally by the aid of bodies which contain the base of vital air or oxygene.

31. In the ordinary chemical analyses the nitric acid is employed, as furnishing this base with the greatest facility.

32. In the great operations of nature, it is furnished by the air of the atmosphere, and by water.

33. Wherever the atmospheric air disengages, whether carbone, or azote, there is formed in the first case carbonic acid gas, in the second, azotic gas.

34. Whenever water furnishes the base of vital air, hydrogene or inflammable gas is disengaged.

35. In the intestinal canal, in the lungs, and on the surface of the skin, all these operations are brought about when in contact, more or less, with atmospheric air. In the intestinal canal they are performed likewise through the medium of water, which is the common vehicle of the alimentary mass, and of the fluids which are mixed along with it.

36. In the intestinal canal, especially in the stomach, where the atmospheric air undergoes less alteration; in the lungs; and on the surface of the body; there is formed more or less of carbonic acid.

In the intestinal canal, and particularly in the small intestines, where the mass of alimentary matter is more liquid, and more homogeneous, besides the former, there is disengaged hydrogene gas.

Is azotic gas disengaged in the intestinal canal, as well as in the organs of respiration?—The question is at least doubtful.

37. These observations give rise to the following conjectures,

In the alimentary canal the oxygene, whether derived from the atmospheric air, or furnished by water, and separated from the hydrogen, combines itself with the animal secretions and the aliments blended with them. From the aliments the oxygene separates the carbone, which is disengaged in the form of carbonic acid gas, and which is again absorbed; from the intestinal secretions, it disengages the azote and favours the combination of it with the alimentary matters which receive it, in place of the carbone which they had lost.

38. In this way the alimentary substances begin the process of animalization and assimilation, the degree of which we might estimate, if we knew perfectly the nature of the chyle which is the result.

39. Respiration afterwards acts on this chyle diffused and blended with the blood, in the same manner as the aliments were before mixed with the animal secretions in the intestines. Oxygene is again applied, it acts on the carbone of the chyle which is disengaged in the form of carbonic acid, it acts also on the azote of the venous blood, and combines itself with the chyle in proportion as this loses its carbonic principle.

40. There takes place here then, as in the intestines, a real exchange, and by the mechanism of respiration, the proportion of carbone diminishing, and the proportion



proportion of azote increasing in the chyle, this nutritive fluid becomes animalized and assimilated.

41. One might say that the blood becomes assimilated also; for without the mixture of the chyle, losing its carbone constantly by the continued action of respiration, it would become too highly animalized, and would contract those changes which are observed to follow whenever too long an abstinence has taken place, or the aliments, too highly animalized themselves, prevent the fluids from acquiring the temperature which is necessary, from the mixture of mild and recent chyle.

42. After this important mechanism comes that of the functions of the skin. It seems probable that on the surface of this organ, which perhaps is to the lymphatic system what the lungs are to the sanguiferous, the combination of oxygene from the atmosphere occasions equally the carbone to be thrown off, and consequently, in this way, contributes to the progress of animalization.

#### CONCLUSION.

43. It appears, then, that a great part of the operation, the result of which is the assimilation of the food, is performed in the intestinal canal, in the organs of respiration, and on the surface of the body; that this operation may therefore be divided into three stages, which calls to our mind the three cotions of the ancient physicians; that in all these stages, the atmospheric air, and particularly the vital part, or oxygene contained therein, is the principal instrument of the combinations by which, the assimilation is brought about; that it acts, probably, by subtracting from the alimentary matter a portion of its carbone, and fa-

cilitating its combination with the azote superabounding in the animal fluids; that, in consequence, in this common operation, the execution of which is divided between three different organs, but founded on the same principles, there is at the same time a reciprocal change made both in the substance of the food, and the animal fluids, by which the one being animalized, the others are deprived, if we may so speak, of their excess of animalization, all are brought to the same level, and thus mutually assimilated.

44. M. Jurine is aware that this theory does not explain the formation of all the products of animal assimilation; that neither the production of phosphoric salts, nor the fat matter resembling spermaceti can be hence explained; that, for stronger reasons, we cannot hence see in what manner those other animal productions are modified, on which chemistry as yet has thrown no light; and that consequently his theory is incomplete. To this he answers, that the facts at present known, and the observations hitherto made, have enabled him to proceed no farther; but the combination of azote with animal substances, is already an object of importance sufficient to make us consider the mechanism of this combination as one of the most interesting points in the animal œconomy.

45. Upon the whole, whatever opinion may be formed of this theory, it may be concluded, with some degree of certainty, from the facts and reflections here brought forward, that the atmospheric air is one of the most powerful agents in animalization, in assimilation, and consequently of nutrition.



## XIII.

*A practical Essay on a certain Disease of the Bones, termed Necrosis. Illustrated with Six Plates. By James Russell, F. R. S. Edinburgh. Fellow of the Royal College of Surgeons, and one of the Surgeons to the Royal Infirmary of Edinburgh. 12mo. 209 Pages. Price 3s. 6d. London, Robinsons, 1794.*

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BY the term necrosis is understood a disease of the bones, where the whole, or part of a bone, dies, and is thrown off, and a new bone produced. In this disease new parts are formed in a very curious manner, and with a degree of perfection altogether extraordinary. For after the entire loss of the original bone, the formation of a substitute one enables the patient to perform all the usual functions of the limb, without any sensible inconvenience or difficulty; and it is a very remarkable circumstance, that, in favourable instances of the disease, the power of motion is preserved during all the time these changes are going on. Consequently the new bone must have begun to grow, and must have acquired firmness before the old bone separates and comes away; else there must be an interval of time at which the power of motion would be entirely suspended. Since it is plain that if the original bone were to separate while the incipient substitute was still soft and flexible, the limb could perform no motion which re-

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quired

quired the assistance of a solid support, and would therefore be compleatly useless.

The new bone, therefore, is formed and consolidated before the old bone separates; it surrounds the old bone, and is larger in size, but equal in length.

The process which nature follows in the formation of the new osseous shell, seems to be the following; the old bone serves as a mould for the new one. And the first step of the process is to surround the old bone with an effusion, which seems to be of a gelatinous nature.

This effusion is more dense as it approaches to the surface of the old bone, and more rare as it recedes from it. The thickness of the stratum is variable, but it always is considerable, and in certain cases it appears to exceed an inch. For in some instances the new osseous shell has been found an inch thick, after the ossification is complete, so that the thickness of the original effusion must be greater than this, as the whole of the mass never is entirely converted into bone. And indeed before any bone begins to form, this effused stratum acquires an additional degree of consistence. After these ossific nuclei make their appearance in different places, and quite distinct from each other, they increase in number, and enlarge in size, till at last they come into contact, and unite together, so that the whole of the effused stratum is converted into a mass of bone. The earliest date of the appearance of these nuclei in the human subject, is (according to the author's observation) twenty-four days from the original commencement of the attack. But for some months after a stratum of solid bone has been formed, additional nuclei are occasionally forming,



ing, attaching themselves to the ossified stratum, and thus making a gradual addition to the bulk of the general mass of bone.

The process proceeds in this manner, until the ossification extends completely along the whole length of the original deposition, and around the whole of its circumference. The new bone which forms, is perfectly hard, and completely organized, but not disposed into the same regular lamellae with the primitive bone. It is likewise capable of assuming all the actions competent to a bone of the most regular and perfect structure. If any part of it meets with any injury which deprives it of life, the dead portion then separates from the living, by the process of exfoliation. It is also capable of giving birth to ossific granulations; which are at last converted into solid bone. So that it appears to possess all the properties of a bone in the most perfect state of health and vigour.

From the account given of the manner in which this new bone forms, it is evident that the tendons of the muscles must retain their relative positions with respect to each other, and be inserted into points in the new bone, corresponding to their original insertions into the old bone. Because, at the time of the primary effusion, all the tendons lie in their natural and relative places; and in this state they are surrounded and fixed by the gradual consolidation and ultimate conversion of the effusion into solid bone. And thus it is easy to comprehend the way in which the insertion of the muscles is transferred from the old bone to the new one.

The manner in which the tendons disengage themselves from the old bone, is equally easily conceived.

The

The tendons are in a living and healthy state, and consequently incapable of continuing united with parts which are dead. They must necessarily, therefore, separate from the old bone, when it dies. And as they are previously attached to the nascent bone, no derangement results from the separation; which is effected without violence.

The dead portion of the old bone, which separates from the living portions, is distinguished by the appropriated name of *sequestra*, and is a part which makes a conspicuous figure in the future management of the case.

Having given a general account of the disease, the author proceeds to the history of particular symptoms.

In every case of necrosis, a severe deep seated pain is the first symptom which appears. This pain at its commencement is not aggravated by pressure. But as the inflammation travels outwards, and acquires a more superficial situation, the external parts become more sensible, till at last they acquire the sensibility of parts in a state of high inflammation.

Neither the size nor the shape of the limb undergoes any sensible change for some time. But so soon as a stratum of materials is laid for the deposition of osseous matter, the limb becomes much enlarged along the whole course of the bone; and this enlargement occurs at an early period of the complaint, and soon attains its full size. In the leg, which is a common seat of necrosis, this enlargement may be distinctly traced along the course of the tibia.

These symptoms do not long remain stationary; but sooner or later acquire an addition to their number.



ber. For, shortly after the commencement of the attack, an external inflammation succeeds, and this is soon followed by suppuration, and a collection of matter, which at last discharges itself externally by a small opening. The extent of this inflammation is not in general great; though for the most part a number of similar inflammations make their appearance about the same time. They all of them discharge matter externally through small openings which do not close, and by continuing open and discharging matter, prove the origin of a number of fistulous sores.

The matter which discharges from these fistulæ is almost uniformly of a good quality, as to consistence, colour, and smell. In these respects it differs from the quality of the matter discharged from a diseased bone, which is at all times exceedingly fœtid, and in general discoloured and thin. In point of quantity, the discharge of purulent matter is always very great, in proportion to the number and size of the external openings; because they are only the termination of passages which conduct to an extensive cavity. The quantity of discharge is not increased by the application of pressure to the external parts of the limb.

A probe introduced into the orifice of the fistula, seldom penetrates to any great depth, or discovers any loose piece of bone; for, in this stage, the sequestra can very seldom be felt.

After this period the appearances differ very much, according to the manner in which the case is to terminate, which is two-fold. In the one, the mildest and most desirable termination, the ulcerations gradually heal up, without exhibiting any unusual appearance.

pearance. The sequestra never is seen, and the patient, if he ever had lost the use of the limb, soon regains it. After this, no vestige of the disease remains, excepting a permanent enlargement and induration along the course of the bone.

In the other termination, the sequestra makes a conspicuous figure. It appears externally, by forcing a passage for itself through the new-formed bone, and the common integuments. Sometimes it works its way out, without being preceded by any considerable suppuration, and without much pain ; sometimes these are considerable.

In other cases of necrosis, it is not the extremity of the sequestra, but a part of the middle portion, which presents itself upon the opening of the abscess. The new shell of bone incloses it on every side, and though it permits of motion upwards and downwards, in the direction of the cavity of the bone, yet it confines the sequestra too closely to admit of any lateral motion. Under these circumstances an operation is highly necessary to complete the process. The cavity which remains is gradually filled up, and the cure completed.

Of all the bones of the body the tibia is the most frequent subject of necrosis ; and next, perhaps, in point of frequency, the femur and lower jaw ; and then the clavicle, humerus, fibula, radius, and ulna. The flat and irregularly shaped bones do not seem to admit of reproduction by this process.

With regard to the duration of necrosis, this varies, according to the age of the patient, and to the part affected. The lower jaw, the author has observed, is capable of completing the process in the shortest



shortest time. A cure may be completed in less than three months from the first attack. But in the tibia this is never effected in less than twelve months. In general, it is a longer time, and sometimes two years.

Persons from the age of puberty to eighteen or twenty years are most liable to be attacked with this disease; and the state of the constitution has a great share in favouring the attack. When this disposition prevails, an individual will often suffer from attacks on different bones at the same time, but more commonly at different times. The predisposing causes of the disease are very uncertain. The scrophulous habit seems to give a tendency to it. Any causes of inflammation may become exciting causes of necrosis.

Necrosis is liable to be confounded with two other cases: the first is a general enlargement of the bone; the second, a case of common exfoliation of an external lamella. In the first instance, the progress of the disease is more slow, and not necessarily attended with pain at the commencement. The external soft parts are neither swelled nor inflamed, nor do they adhere to the bone beneath. And as this case is not attended with suppuration, there are no fistulous ulcers to discharge matter.

In a common exfoliation, besides other marks of distinction which are sufficiently obvious, the matter discharged is in general foetid and thin; and the quantity not so great in proportion to the surface of the fore, as in necrosis. The complexion of the ulcer is also more unfavourable.

With regard to the prognosis in cases of necrosis, it may be said upon the whole, that the disease is not of a dangerous nature, it never attacking a part whose action or existence is essential to the preservation of life. The pain, irritation, and copious discharge of matter may induce hectic fever, which may bring the patient into danger. If he surmounts the danger which attends the incipient stage of the complaint, the succeeding stage is far less dangerous. For, once the primary inflammation is mitigated or subdued, there is no particular danger to be apprehended while the new bone is forming. When the sequestra becomes moveable, and begins to irritate the internal surface of the new bone by friction, a return or increase of pain and distress may be expected. When it remains confined within its new covering, without making any effort to escape, the symptoms of the disease are seldom violent. In this stage, the estimate of danger is to be taken from the impression which the local affection makes upon the general state of the patient's health.

*Method of Cure.*

It is perfectly evident, the author observes, that an attack of necrosis admits of no relief from any general treatment of the constitution. The disease is perfectly local, and too deeply rooted in the seat of attack, to yield to the impression which any general remedy can make; so that any pretensions to cure, or even to relieve an attack of necrosis by any course of internal medicine, is quite preposterous.

There is even much reason to question, whether any real benefit can be derived from the use of topical applications. It is true, the disease commences by an attack of inflammation. But then the inflammation



mation is always so deep seated, and often so severe, that no local treatment has power to prevent or to check it. The common practice in cases of local inflammation, topical blood letting, and the application of cooling astringent solutions, has little effect in this particular case. Because, besides the depth and violence of the inflammation, there is probably some tendency to terminate in a peculiar way; so that the means which are sufficient to counteract an attack of simple inflammation, prove less effectual in this. No other practice, however, is applicable on the occasion, and a trial of it is naturally suggested by the intensity and continuance of the pain; so that whenever an attack of necrosis is suspected it is certainly advisable to try the usual means of counteracting inflammation: and it is clear, that whatever degree of efficacy these means possess, they can be attended with advantage only at the incipient stage of the attack. It must, however, always remain a matter of doubt, how far the use of them is beneficial, since the proof of the existence of the disease, immediately upon its commencement, is too obscure to admit of much certainty. Yet as the practice is perfectly innocent, and cannot possibly prove injurious, no objection appears against giving the patient every chance of relief which the use of it affords. But if the attack be not at once subdued, or its approach averted, we must then expect the disease to follow its natural progress, in which art can do no more than to regulate the course of the attack in some particular circumstance.

As the safety of the patient's life is endangered from the extent and violence of the inflammation, in

the first stage of the disease, before the new shell is formed, or the sequestra loose and ready to separate, the assistance of art can be of little service, because any attempt to extract prematurely the sequestra by force, would, by increasing the inflammation, augment the danger. When, therefore, palliative means do not succeed, and the patient's strength is sinking, there is no alternative but amputation.

When the patient survives this stage, the object of practice is to remove the sequestra at a proper time. But there are two opposite states of the complaint, in which no interference is necessary. The first state is that in which the sequestra is dissolving and carried out of its place without ever making its appearance externally, or giving any considerable disturbance to the constitution.

The second state is that in which the sequestra is escaping from its confinement, without violence, and without being the occasion of much inconvenience or uneasiness.

But in the intermediate state of the disease, where the pressure of the sequestra is a perpetual source of irritation, the assistance of an operation becomes requisite to bring the disease to a happy issue by its removal. It is however a point of nicety to determine the proper time to perform the operation.

Two principal varieties of the disease come here under consideration. The one is, that dubious case in which the existence of the sequestra is not marked by the presence of any external visible symptom.

In this case if the pain be moderate, and the patient suffers little inconvenience from the complaint, an operation is quite superfluous. But when  
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the symptoms are violent, it then becomes a question to determine how far an operation may be requisite. There is not the smallest doubt that if a large sequestra be imprisoned and cannot escape, its removal by an operation must be of essential service. But then the difficulty consists in ascertaining the exact state of the parts within the center of the limb. We are guided in our judgement here from considering the duration of the complaint, and age of the patient. The exact period of time which affords most advantage for operating cannot indeed be given with perfect precision, but, from the observation of various cases, the author supposes, that about three months from the time of the attack would in general be the most proper period.

We may derive some assistance in this point from attending to the local circumstances of the case. If, for example, the pain be abating, and the quantity of matter diminishing, it is probable that the sequestra is consuming very fast, and will soon be completely destroyed. To confirm this idea too, it is possible to examine the state of the bone, without proceeding to any violent operation. For this purpose it is sufficient to uncover different portions of no great extent, near where the fistulous openings are, and by introducing a probe, or if that be impracticable, by making perforations with a small drill, to explore the state of the cavity. If, upon this examination, we discover that the cavity still is extensive, and contains a sequestra of considerable size, the necessity of operating becomes apparent. On the contrary, if the whole of the cavity be filled up with osseous matter, and no remnant of sequestra is to be found, these circum-

circumstances clearly indicate the propriety of trusting the cure entirely to nature.

In the other case, the proper mode of practice to be pursued is sufficiently obvious; the exposure or protrusion of the sequestra removes all uncertainty as to the nature of the case. Under these circumstances an operation is in general adviseable to accelerate the removal of the sequestra. But even this, the author thinks, may be dispensed with, where the sequestra separates so slowly as to cause no sensible degree of irritation.

Having spoken at length of the general treatment, Mr. Russell proceeds to mention the operation necessary to be performed for the extraction of the sequestra. He stops however to notice a proposal which has been made, for dissolving the sequestra, by injecting an acid liquor into the cavity of the new bone. The experiment has never yet been tried, nor is it probable that it will. The objections to it, indeed, are numerous and obvious.

The operation to be performed in cases of necrosis is neither delicate nor difficult, and requires no superior judgment or dexterity. It consists in extracting the sequestra through an aperture in the new osseous shell.

The first step of the operation is to lay bare the bone; and this may be accomplished either by a scalpel, or by caustic. But the former method is preferred by the author, as less painful, and not necessarily subjecting the patient to the loss of skin.

The place, direction, and extent of the external incision must be determined by the number and situation of the fistulous openings in the skin. A portion of the



the new bone under one of these openings, sufficient to permit the surgeon to explore the parts beneath, is first to be laid bare. In this space he will probably discover an opening in the bone which leads directly to its internal cavity, for in general every external fistula is produced and supported by such an opening, and corresponds nearly to the place of it. If this opening in the bone be so narrow or so irregular in its course, that a probe cannot be made to pass, then, in order to ascertain the exact state of the disease, the next step is to bore a small hole in the bone, by means of a perforator or common drill. If the bone be hollow with a large cavity in the center, the perforator, after penetrating through the thickness of the osseous shell, will go suddenly down from the want of further resistance, till it meet with the internal surface of the shell on the opposite side. We can from hence ascertain the diameter of the cavity of the new bone. A number of similar perforations made at different distances, and at such places as the external openings indicate, determine the state of the central parts of the bone. The pain which attends the making of these perforations is not considerable. After the perforator is withdrawn, we may introduce a probe in its place. And if the perforation be large, and the probe small, then it admits of being bent, so as to explore the state of the whole internal cavity, and determine both its extent, and whether or not it contains a portion of undissolved sequestra. By proceeding in this manner, we have it in our power to ascertain all the circumstances requisite to be known previously to the last step of the operation.

If either the skin be unsound, or a considerable portion of bone is to be cut out, it then becomes necessary to remove a corresponding portion of the skin. The separation of the skin, from the bone is more troublesome than in ordinary cases, on account of the adhesions being greater, and from the want of the periosteum.

The next step is to cut out a portion of the new formed bone; and when this is still in a soft state, the whole of the operation may be performed by means of a common scalpel, provided it be strong, and of a large size, because the stratum of a new bone, previous to its complete ossification, admits of being cut with a sharp knife. This is seldom, however, the case. A saw of some kind, therefore, is commonly requisite to complete the operation; which may be performed in two different ways.

The operator may either make a number of different perforations with the head of a trepan, placing them in contact with each other, so as to form a continuous opening; or he may make a deep incision at the top and bottom of the bone, by means of a circular saw, and then cut out the intervening portion, by means of a googe and mallet,

The last method is the most expeditious; but is not equally well adapted to every case of necrosis; for when the bone is thick and hard, the googe does not easily cut through so solid a substance. The other method is therefore preferable. The gradual enlargement of the opening, by means of the trepan affords us an opportunity of judging how far any advantage may be gained, by breaking down the sequestra into separate pieces; for if it be of a large  
size,



size, we may often very much facilitate the extraction of it by this means. It also frequently happens, that the sequestra is firmly wedged in at the extremities, though it be loose at every other part; and in these cases, removing a portion from one end, allows the whole to be easily withdrawn. By this expedient, we save the patient all the inconvenience of making a larger opening, and of leaving a larger extent of surface in the state of an open sore; so that whenever the aperture in the bone is of sufficient size to permit the extraction of the sequestra in separate pieces, it always is adviseable to have recourse to the division of it. In general, it may be divided by means of cutting pliers; or if it be too hard and solid to yield to them, it is always possible to remove a portion of it, by applying a head of the trepan.

The removal of the sequestra completes the operation, which, though tedious, is not painful in proportion to the severity of its appearance.

After the operation, the simplest dressings answer best. In less than a week, the whole surface of the sore assumes a healthy aspect, and the cavity of the bone becomes covered with granulations. These gradually extend till they fill up the whole cavity, and reach the level of the surface, when cicatrization takes place.

The cure, from the removal of the sequestra till its final completion, requires, in cases of necrosis of the tibia, from four to six months; and in other bones, a longer or a shorter time, in proportion to their size, and to the age of the patient.

When the cure is finally completed, the substitute bone is filled up with solid matter, and becomes in

every respect similar to a case of necrosis, in which the sequestra had been wholly consumed, without making its appearance externally. The affected limb is left larger and less shapely than the other, but in fulfilling all the useful purposes of life, its functions are no ways impaired; for the patient is not susceptible of any additional weight, nor does he suffer any other perceptible inconvenience.

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Thus we have given a very full account of the Essay before us; and we have done so for different reasons. Notwithstanding, the author observes, the appearances which a case of necrosis exhibits are so striking, that one might have expected them to have attracted the notice of the earliest practitioners in Surgery, and to have been recorded in the writings of the first authors, yet this has not been the case. No mention is any where made of this disease till the time of Albucasis, who is supposed to have lived towards the close of the eleventh century. From that time till the present, it has very seldom been described, and indeed does not appear to have been sufficiently understood.

The clear and systematic manner in which the subject has been treated by Mr. Russell in the present performance, entitled it, likewise, to a very full consideration.









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THE  
MEDICAL and CHIRURGICAL  
REVIEW.

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SEPTEMBER 1795.

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Art. XIV. *The Elements of Medicine of John Brown, M.D. Translated from the Latin, with Comments and Illustrations, by the Author.* A new edition, revised and corrected, with a Biographical Preface, by Thomas Beddoes, M.D. and a head of the Author, 2 vol. 8vo. 700 pages, price 12s. boards. Johnson, London, 1795.

DR. BEDDOES thinks it necessary to state his reasons for undertaking the present edition of the celebrated work of the late unfortunate Dr. Brown; a work, in the estimation of Dr. Darwin, who must be allowed a competent judge, of considerable genius. It was not, Dr. Beddoes remarks, either the hope of fame or of profit, or enthusiastic attachment to the ingenious author's system, that induced him to submit to a task so extremely unpleasant. The penury in which Dr. Brown lived, and the distress in which he left his family, are so well known, that to mention them can be no indelicacy. Soon after his death, a subscription in their behalf was set on foot, and produced considerable temporary advantage. But as the circumstances which gave rise to that subscription still, in a great measure subsist, it was conceived by some benevolent persons, that a republication of his system, of which few copies remain on sale, might contribute to the same desirable end. To effect this, application was made to Dr. Bed-

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does, who benevolently agreed to afford his assistance to so good a design.

In his translation, observes the editor, Dr. Brown seems to have exceeded his usual negligence. His English it is true, when he is unfettered by the Latin idiom, shews that he was poorly qualified to do his own work justice, had he exerted his utmost care. These two causes conspired, with the laboured perplexity of his Latin stile, to render the translation disgustingly uncouth throughout, and in many passages almost impenetrably obscure. Besides, strange as it may appear, he sometimes mistakes either his own meaning, or the import of the English terms, in which he tries to convey it. Of this Dr. Beddoes has adduced some instances.

The chief view of Dr. Beddoes was to render the author's meaning plainer, by correcting his language throughout. Few, it is presumed, have hitherto had a precise knowledge of a system, which appears to have wrought a memorable change in medical opinions and practice. — In the typography of the first edition there was a remarkable peculiarity. The supplementary words inserted in the text were printed in *Italic* characters, and very frequently short explanatory phrases were placed at the foot of the page. This seems to have been done in imitation of the English Bible; and it is probable that the author considered his Latin text as sacred, both on account of the purity of the stile, and the excellence of the doctrine. But as few readers will regard it with the same reverence, and as the effect is disagreeable, the printer has been directed to change the *Italic* for Roman characters, and to take the short phrases into the text. There were also certain corrections, as well as additions to the original work, given in English in the text, and in Latin at the bottom of the page. These are omitted. A few of the author's longer notes, for the convenience of the reader, are received into the text.

Such are the motives and nature of the present undertaking: that it may answer the end proposed, every benevolent mind must wish.

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The translation is prefaced by extensive observations on the character and writings of Dr. Brown, by the learned editor. Striking proofs are brought forwards of the early marks of genius which he exhibited, previous to his applying himself to medicine. His first views appear to have been directed to religious studies, and he appeared to have possessed no ordinary share of enthusiasm; or perhaps it may be deemed fanaticism. At first he was firmly attached to the seceders from the established church of Scotland; while he was thriving in godliness and knowledge, there occurred an incident which finally diverted him from the path he had hitherto pursued with so much alacrity. At a meeting of the synod of the Merse of Teviotdale, a party of his school-fellows urged him to accompany them to the parish church of Dunse. He manifested reluctance, but yielded to their importunity, and remained to hear the sermon. The scandal did not pass unnoticed. He was summoned before the session of the seceding congregation; but not choosing either to atone by an apology for his sin in mixing with profane worshippers, or to wait for a formal sentence of excommunication, he abdicated his principles, and professed himself a member of the Establishment. Thus, bigotry is often but the mask of avarice, pride, and ambition; and here, though the nature of his present zeal was a secret to the zealot himself, we see it fully disclosed by this instructive anecdote. The opinions he had so warmly cherished lost all their value in his estimation; or rather, perhaps, became odious from the disgrace with which they threatened him.

When he had directed his thoughts to the study of medicine, the only difficulty lay in the expence: but his observation might have suggested the means of overcoming this difficulty. He must have been aware that students of physic are, in general, by no means such proficient in classical acquirements as to speak Latin with tolerable fluency. Hence, before the examinations for a doctor's degree, which are carried on in Latin, it is common to have recourse to a private instructor, who



converses with the candidate in that language. This preparation is familiarly called *grinding*, as a similar process at Cambridge is called *cramming*. The translation of inaugural dissertations into Latin, which the students, in most instances, compose for themselves in English, is another occupation from which a good scholar may derive emolument at Edinburgh; the ordinary gratuity for a translation being five, and for an original composition, where that is required, ten guineas.

Of his qualifications for these employments, accident, shortly after an unsuccessful competition for the vacancy of one of the classes in the High School at Edinburgh, furnished him with an agreeable proof. Application being made to one of his friends for a person to turn a thesis into Latin, Mr. Brown was mentioned. He performed the task in a manner that exceeded the expectations both of the friend and the candidate. When it was observed how much he had excelled the ordinary style of such compositions, he said, *he had now discovered his strength, and was ambitious of riding in his own carriage as a physician*. Towards the close of 1759, therefore, he settled at Edinburgh in the double capacity of teacher and student. At the opening of the session he addressed a Latin letter to each of the medical professors. They were perhaps already apprized of his merit as a classical scholar; and they were all induced by his application to present him with a ticket of admission to their lectures. After so auspicious a beginning, he soon became famous as a teacher of Latin, and never afterwards refused to exercise his pen in the translation of theses. He was at all times also ready to furnish an original dissertation, according to the system his employer preferred.

From the celebrated Cullen he early received the most flattering marks of attention. This speculatist, observes Dr. Beddoes, like Boerhaave and other men of genius in the same station, was accustomed to watch the fluctuating body of students with a vigilant eye, and to seek the acquaintance of the most promising. There  
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was a period when he made the greatest exertions to gain proselytes to his opinions; and his mind was doubtless alive to that pleasure which the encouragement of merit affords to all who are capable of discerning it, when no dread of rivalry interferes with the gratification. But Brown's power over the Latin language served him as a peculiar recommendation; and his circumstances might induce Cullen to believe that he could render this talent permanently useful to himself. Taking therefore its possessor under his immediate patronage, he gave him employment as a private tutor in his own family, and spared no pains in recommending him to others. A very strict and confidential intimacy ensued; the favoured pupil was at length permitted to give an evening lecture, in which he repeated, and perhaps illustrated, the morning lecture of the professor; for which purpose he was entrusted with Cullen's own notes. Friendships, observes the Editor, originating in protection, are very prone to terminate in enmity, unless difference of rank and pursuits totally preclude competition; and it is well known that the friendship in question was far from permanent. The immediate causes of alienation in the present case are not certainly known. The opposition made by Cullen to his election to the vacant professorship, in the theoretical chair, on the death of Dr. Alexander Monro Drummond, and likewise to his admission into the Philosophical Society of Edinburgh, give probable grounds for supposing, that the professor was actuated not by the purest motives. "Being estranged," says one of his intimate adherents, "from Dr. Cullen's family, he gradually became his greatest enemy; and shortly afterwards found out the new theory of physic, which gave occasion to his publishing the *Elementa Medicinæ*, in the preface to which work he gives an account of the accident that led to this discovery. The approbation his work met with among his friends encouraged him to give lectures upon his system. Though his lectures were not very numerously attended by the students, on account of



“ their dependence upon the professors, still it was al-  
 “ ways remarked, that the cleverest among them were  
 “ all, as they were now called by way of nick name,  
 “ Brunonians. Hence arose that persecution which was  
 “ carried on with such rancour, that it at length obliged  
 “ him to leave Edinburgh.”

His prospect of maintaining himself by teaching medicine at Edinburgh becoming every year worse, he at length carried into execution a design which he had long meditated, and to which he had received some encouragement. In 1786 therefore he embarked for London. Immediately on his arrival, an incident befel him, which afforded a striking proof of his simplicity. The peculiarity of his appearance as he moved along — a short square figure, with an air of dignity, in a black suit, which heightened the scarlet of his cheeks and nose — fixed the attention of some *gentlemen* in the street. They addressed him in the dialect of his country; his heart, heavy as it must have been from the precariousness of his situation, and distance from his accustomed haunts, expanded at these agreeable sounds. A conversation ensued, and the parties, by common consent, adjourned to a tavern. Here the stranger was kindly welcomed to town; and after the glass had circulated for a time, something was proposed by way of sober amusement — a game at cards, or whatever the Doctor might prefer. He had been too civilly treated to demur, but his purse was scantily furnished, and it was necessary to quit his new friends in search of a supply. Mr. Murray was the person to whom he had recourse; the reader will not wonder that his interference should have spoiled the adventure.

Change of residence wrought no change of conduct. Some of his friends were disgusted by those habits of intemperance which repetition had unalterably fixed. He spoke in sanguine terms of the probability that his system would become at length triumphant; but whatever he said or imagined, he effected little. He could not in reason expect to find a cordial welcome among his  
 brethren



brethren in England. Public opinion can alone awe the body of established practitioners in any country into toleration of innovators; and knowledge on this subject was too little diffused for public opinion to operate with effect in his favour. On the 7th of October 1788, when he was about fifty-two years of age, he was seized with a fatal fit of apoplexy. He died, it is said, in the night, having swallowed as he went to bed a very large dose of laudanum; a species of dram to which he had been long addicted.

We extract the following general observations of the learned editor on the principles of the Brunonian system.

“ It was not unusual for Brown’s disciples to disagree, when they were called upon for a strict interpretation of his principal tenets. If they be rigidly examined, they will be found, I think, not quite consistent with his own important doctrine of the accumulation of excitability, during different states of inaction. It appears to me, that according to his first chapters (xviii.) living beings ought to have proceeded through languor to death in one unbroken tenour of wakefulness, and that all the images and lamentations which sleep has suggested to the poets, would have been lost. He who assumes that a certain portion of excitability is originally assigned to every living system, by his very assumption, denies its continual production, subsequent diffusion, and expenditure at a rate equal to the supply, or greater or less. That the brain is an organ destined to secrete the matter of life, he could never have supposed, otherwise he would not have expressed a doubt whether excitability be a quality or a substance.

“ If we admit a successive supply of this principle, we may solve, in a very easy manner, several difficulties, for the sake of which new epicycles must be added to Brown’s system. In the cold bath we may imagine the generation of sensorial power to proceed with small diminution, while the actions on the surface of the body are considerably abated by local subduction of heat. Thus the well known glow will be the effect of undiminished

nished production within, while external expenditure is diminished. But weak persons do not experience any glow. Here the action on the skin affects the system universally; the production, therefore, is checked from the torpor of the discerning organ, and this state of the brain explains the head-ach and chillness, subsequent to the misuse of the cold bath. These effects are not, in my apprehension, easy to be reconciled to the hypothesis of a fixed original stock of excitability; the same thing may be said of seeds and eggs long preserved, without sensible change, in a state capable of germination and growth. Sleep sometimes produces no refreshment, and yet it seems not to be imperfect or disturbed, in proportion to the languor felt on waking. This I have attributed to a failure in the supply of excitability;\* and nervous fever is imputed, by another physiologist, to this cause of debility, of which Brown had no suspicion. — If an illustrative analogy be desired, his excitability might be compared to a fluid lodged in the body as a reservoir. According to the statement which I think more consonant to the phænomena, excitability would be like a fluid issuing from the brain, as water from a spring. These resemblances might be traced a little way, but they soon fail, as always happens in matters so essentially dissimilar.

“ The hypothesis of Brown is happily adapted to the limited term of life; according to the other supposition, we must conceive old age and death to depend upon a limited power of secretion in the brain. The difference is scarcely perceptible here, but in terms; it is, however, pleasing to suppose that wiser ages will be employed in the culture of the human species to which prolongation of life is essential: and we can more easily reconcile our thoughts to augmentation of power in a discerning organ, than of the original provision of excitability; so that the doctrine, in other respects the more probable, seems more conformable to the prospect of improvement.”

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\* Observations on Calculus, &c.



• The Brunonian system has frequently been charged with promoting intemperance; the objection is serious, but the view already given of its principles shews it to be groundless. No writer had insisted so much upon the dependence of life on external causes, or so strongly stated the inevitable consequences of excess. And there are no means of promoting morality upon which we can rely, except the knowledge of the true relations between man and other beings, or bodies. For by this knowledge we are directly led to shun what is hurtful, and pursue what is salutary; and in what else does moral conduct, as far as it regards the individual, consist? It may be said, that the author's life disproves the justness of this representation; his life, however, only shews the superior power of other causes and of bad habits in particular; and I am ready to acknowledge the little efficacy of instruction, when bad habits are formed. Its great use consists in preventing their formation; for which reason popular instruction in medicine would contribute more to the happiness of the human species, than the complete knowledge of every thing which is attempted to be taught in education, as it is conducted at present. But though the principles of the system in question did not correct the propensities of its inventor, it does not follow that they tend to produce the same propensities in others.

• The distinguishing merit of Brown is obvious; he avoided all false analogies, and confined himself within the proper sphere of observation for a physician. Hence at a time when I could not be suspected of that disposition to diminish the faults, and magnify the excellencies of his system, which my share in the present publication may be supposed to produce: I was led to remark, that “if he has not always discovered the truth, he is seldom forsaken by the spirit of philosophy.”\* Before him, investigations relative to medicine, had been carried on just as rationally as if to discover the qualities of the horse, the naturalist were to direct his

his attention to the movement of a windmill. There existed no system which was not either entirely, or in a great measure, founded upon the observed or supposed properties of substances, destitute of life. Thus Boerhaave taught that diseases depend upon changes of the blood, similar to those which certain oily, watery, or mucilaginous liquors undergo; I have already had occasion to shew that Cullen referred the phænomena of life to an imaginary fluid, endowed with the same properties as the electric fluid, of which the very existence is still problematical. His predecessors having in this manner left man entirely out of their systems, or assigned him an unimportant place, Brown achieved the important service of restoring him to his proper station in the centre. We have other obligations to him;—but as I have already had occasion to point out some of them in the course of these preliminary observations, and as the rest will be discovered by an attentive perusal of the following work, I shall leave the task of singling them out, and appreciating them, to the impartial reader. In forming this estimate he should have before him, 1. The difficulty of emancipating the mind from the dominion of inveterate and accredited error. 2. The much greater difficulty of giving a mere form to a complicated and obscure science.

‘ Three years ago I had occasion to observe, that the opinions of Brown had been so widely diffused by oral communication, as to affect the whole practice of medicine in Great Britain. In pamphlets, recommending repeated doses of opium to support excitement, and in other publications, it would be easy to detect attempts to purloin his language and ideas; but it is unnecessary, for though literature has always been infested with a race of pilferers, original genius has never been injured by their dishonest practices. Brown cannot now be defrauded of his just reputation. His writings have lately been republished,\* and are gaining credit

\* *Brunonis Elementa Medicinæ cum prefatione Petri Moschati.*



credit on the continent of Europe. In America his superiority to preceding systematic authors appears to be acknowledged alike by professors and students.\*

‘ To speak of the dangerous influence of his system on practice, I think as useless now as to detect plagiarisms. His disciples have sometimes disgraced themselves by that rashness, which was too much the characteristic of his school. But a cool perusal of his work will not produce the effect of his animated, and sometimes frantic prelections. What he has left can only inform or exercise the understanding; but he retains no power to inflame the imagination from the grave.’

Not the least entertaining or just, of the observations here given us by Dr. Beddoes, are those on REPUTATION in PHYSIC. In this science it is well known, that success has seldom been proportionate to merit. Dr. JOHNSON, who must have witnessed physician after physician carrying away the prize of public favour from competition, far superior in particular skill and general abilities, declares, “ that in a great city medical reputation is, for the most part, totally casual. By an acute observer,” he subjoins, “ who had looked on the transactions of the medical world for half a century, a very curious book might be written on the *fortune of physicians.*” This idea is prosecuted by Dr. B. through several pages. We trust we shall not trespass too much on the readers patience by transcribing them.

“ On the most superficial enquiry, it would be manifest that *this* man prospered because he had been of a certain university; *another*, merely because he belonged to a particular sect; a *third*, because he happened to be in the way of procuring a recommendation to some leader in politics or fashion. A great number would be seen to have succeeded in life for the same reason precisely that Falstaff succeeds upon the stage. Few analyse their sensations, and the first impression made by these adventurers was pleasing.  
As

\* See Rush on the Yellow Fever, and some inaugural Dissertations, lately published in Philadelphia.

As far as the dramatic personage is concerned, the reason is unquestionable, but it by no means applies so happily to the other case. The qualities producing the happy impression have, in truth, frequently borne no nearer a relation to professional merit, than Falstaff's pleasantries to solid worth of character; in a variety of instances, they have been no other than symmetry of features or softness of address.

“ It is calamitous enough for individuals, labouring under disease, to fall into bad or indifferent hands; but when the caprice of fortune elevates her worthless favourites to the first eminence in so important a profession as medicine, a more extensive injury is done to society than we should at first imagine. To calculate its amount requires a great deal of thought. Beside the mischief they perpetrate with their own hands, these intruders occupy the station due (if the general welfare is to settle the precedence) to physicians of enlarged views, who would make a beneficial use of its advantages, and impel the defective art on towards perfection. Is an example necessary to enable you to conceive what might be effected by the powerful influence of medical men, enjoying the confidence of the great? A number may be given, but one will suffice; and it is the better for its simplicity. We have not observations from which we can certainly deduce the difference in point of efficacy, between certain warm medicinal springs and common water, heated to the same temperature. The problem, merely for its curiosity, deserves to be solved; and it happens to be peculiarly interesting to that order, from which doctors in vogue receive their amplest gratuities. They have shewn little anxiety for the removal of this difficulty, either for their own direction in practice, or by way of return to their benefactors.

“ They will too often, I fear, be found to have been worse than inattentive to the advancement of their art; and to have discouraged useful investigations by insinuation, if not by direct opposition. Pride and avarice



rice will always combine to render a prosperous adventurer in medicine, whose views are narrow, jealous of improvements, and hostile to improvers. The internal monitor whispers that it was not by knowledge he rose, but by knowledge he may sink. It is therefore the constant expedient of dulness to persuade the world that men of genius are deficient in judgment; though it be certain that the very persons who have been most remarkable for devising new means of relieving distress and removing uncertainty, have also been the most acute in discerning the relations of things. Still, however, *the old way* is judged *the safest*, and crafty mediocrity treasures up the spoils of the credulous and the rich.

“ It is possible to measure the number of degrees by which medicine is more imperfect than it would have been if the public was not so liable to misplace its confidence, and had not actually so often misplaced it. For this purpose, our enquirer, I apprehend, will find in the progress of a kindred art, a standard of easy application. Let it be supposed that a succession of men of specious carriage and mean talents had flourished for a century past, in the place of our great improvers of surgery; then good part of their discoveries had been lost, for we cannot believe that, under discouragement, and with inferior opportunities, Pott, Hunter, and their predecessors could have rendered equal services to humanity. Of these services a concise but clear account should be given; the same scrutiny should then be extended to the labours of the physicians that have flourished during the same period; it may begin with Radcliffe, and may be carried down to our own times. Thus ordinary readers would be put in a condition to judge how far it betrays a spirit of wanton disparagement, to affirm, that a physician in a great city, “ is  
 “ a mere plaything of fortune; they that employ him,  
 “ not knowing his excellence; nor they that reject  
 “ him, his deficiency;” \* these assertions, if they be  
 well-

\* Johnson's Life of Akenside.



well-founded, inevitably lead to a conclusion more important than satisfactory; for however we may be startled, we must infer *that the greatest repute in medicine affords scarce the slightest presumption of superior skilfulness.*

“ Of the fortunate sons of Esculapius, several have been weak enough not to expose themselves to criticism; in most cases, however, we have memorials sufficient to guide our judgment; some have left written documents of their powers; here the proportion between reputation and ability can be estimated with great precision.

“ Considering that his enquiry can be useful only by inculcating salutary circumspection, our author should not be deterred by the first sentiments of repugnance which *the attack* would excite in many minds, nor by the respect due to his virtues, from examining the title of the celebrated Fothergill to present confidence, or posthumous reputation. He should insist the more on this decisive example, because Fothergill really appears to have done his best towards improving the art that enriched him; and because it would be difficult to prove that any among his equals in popularity, have performed, or could have performed, greater things. How far he excelled in sagacity of discrimination, or fertility of resources, would be easily shewn by an impartial survey of his works; and little doubt would remain whether his patients would have sustained much disadvantage, or our present stock of information much diminution, if any well-meaning man of plain sense had moved in his sphere. If the smallest scruple should be left, there exists a piece of evidence which it may be the more difficult to resist, as it comes from the mouth of the worthy Doctor himself. Fothergill and others, have been heard by Dr. G. Fordyce, “ to state in a  
 “ serious harangue, their inspiration, not only in the  
 “ knowledge of diseases, without enquiring into their  
 “ external appearances, but in making prescriptions  
 “ to flow from their pen, without any previous com-  
 “ position



position in their mind; not in compliance with the prejudices of their patients, but from their own belief.\*

From such a comparative estimate, the chief reason why surgery has so far distanced medicine, would appear. Should it be said that surgery must, from its nature, have outstripped medicine, as mechanical philosophy necessarily attained some degree of perfection before chemistry, the justness of the observation may be acknowledged. But after a liberal allowance for this cause of inequality, the author of the investigation would find a far more powerful cause necessary to account for the whole effect. — He might corroborate his inference by an enumeration of the improvements actually made in medicine; from which it would be evident that they have been principally owing to persons enjoying moderate reputation in the country.

Objections will occur to hasty reasoners; and these the author must take care to obviate. “A physician of great eminence may be too busy to write; he may, also, be highly useful in his generation without leaving any traces of his skill behind.” He could not, however, well be more busy than several of the most eminent surgeons, who have found time to write extensive treatises; moreover, his practice and conversation, without the aid of his pen, would so widely spread the knowledge of his discoveries, that the patients of every village apothecary would have cause to bless the London luminary of physic.

The answer to these objections affords a criterion, by which we shall be as little liable to be deceived, as when we judge of the value of a fruit-tree by its produce. *If a physician has attained to great eminence without having made some assignable improvement in physic, if he has neither executed or promoted any designs, tending to this end, he may be safely set down as the narrow-minded creature of artifice, or the spoiled child of chance.* In an age where every incident is brought within reach  
of

\* Fordyce on Fever, p. 160.



of every eye, we may with perfect safety apply to personages so conspicuous the maxim of the schoolmen, that “ what does not appear, is to be reputed not to exist.”

“ The work in question doubtless requires courage as well as other valuable qualities; yet the author, if I do not mistake, would incur less danger at present than at any preceding period. The possessors of surreptitious or accidental fame, would infallibly join in crying or hunting him down, and by signs of alarm bear witness to the merit of the production. But I have reason to believe that the combination would fail in bringing it into total discredit. Some progress has been made in arraigning the peculiar properties of animated nature, and in recommending to mankind the knowledge of themselves. A series of propositions, expressed in intelligible language, and capable of comparison with appearances, has been formed. These propositions, which occur principally in the writings of Dr. Brown, Mr. Hunter, and the author of *Zoonomia*, may be regarded as the foundation of a new science, not less generally interesting than any of the preceding: for it would be difficult to assign a reason why the celestial motions, the working of machines, or chemical phenomena, should be objects of liberal curiosity; to the exclusion of the effects produced by the principle of life. One reason, of which the force will not be easily eluded, may be assigned in behalf of the latter study. It directly tends to promote the well-being, and prolong the existence of the student. The time therefore cannot be far distant, when instruction concerning the causes of health and disease will be acknowledged to form a necessary part of all rational education; and the nearer we approach to this period, with less hazard may the analysis proposed by Johnson, with the plan so enlarged, and the purpose so ennobled, be executed.

“ There is, still, an addition which, in my opinion, would contribute somewhat to precision, and somewhat to secure the sick against the danger of medical slaughter.



ter. This appendix I shall call *JATROLOGIA*, a denomination from which the learned reader may infer, that I have in view some such application of the Linnæan method to physicians, as Baron Born has exemplified in his classification of Monks.

‘ If those assemblages of human animals, that constitute political societies, were arranged according to the nature of their occupations, one class would consist of individuals, depending for their support upon opinion. This class, being provided with a name of Greek origin, might be easily split into orders; of these orders the medical tribe would make one. We have the order broken into genera ready to our hands: of the distribution into species (which is more difficult) a specimen is subjoined. — Our writer’s present concern is only with the genus — *Doctor of Physic*. This genus we may subdivide into sections, or groups: as Linnæus sometimes manages with genera, comprehending a number of species.

‘ §. I. *DOCTORS as desirous, at least, of doing good and extending Knowledge, as of amassing Wealth.*

1. *The philanthropic Doctor, D.* equally sensible of the importance and imperfection of medicine; compares the phænomena of health and disease with unwearied assiduity, that he may form a just arrangement of the actions of life, persuaded that this is the only sure guide in medical practice; cautiously tries new remedies, and abides by the best; beats the coverts of science, that he may himself start something useful; is humane in his conduct, not so much from sudden impulses of the passion of pity, as from a settled conviction of the misery prevailing among mankind.

Var.  $\alpha$ . *The shy philanth. D.* sick with disgust at the manœuvres of his intriguing brethren, runs into the opposite extreme, and keeps too closely retired from public notice.

Var.  $\beta$ . *The renegado phil. D.* possessing activity of mind and integrity of principles; relinquishes the

practice of physic, partly for the same reason as Var. *a.* and partly from dissatisfaction with its helpless state; applies his talents to literature or science.

*Obs.* 1. Several of the greatest accessions to human knowledge are owing to this second variety.

*Obs.* 2. A careful examination and comparison of these two varieties, with some of the succeeding species, will elucidate the nature of those physicians that have usually had great *local* vogue.

More frequent than formerly — not apt to flourish in great cities — otherwise not confined to any particular situation. As self-love grows more enlightened, the more common will this sp. of D. become, till it supplants all the others: man being an animal less liable to be duped as his ignorance decreases.

§. II. D. *Mere Collectors of Fees, regardless of medical Science, given to Artifice and Intrigue, each Species after its own Manner.*

3. *The bullying DOCTOR D.*

———INEXORABILIS, ACER

“ Looks big, struts, swaggers, swears.”

*Obs.* Surgeons, in our times, more frequently bear these marks. According to a most acute contemporary author, the famous RADCLIFFE was a complete specimen of the bullying D. “ With small skill in  
“ physic, and hardly any learning, he got into prac-  
“ tice by vile arts. — He would neglect a nobleman  
“ that gave exorbitant fees;” and to heighten the insult by contrast, “ at the same time carefully attend a  
“ servant or mean person for nothing — he was surly  
“ and morose; treated his patients like dogs — ex-  
“ tended his insolence even to the Royal Family —  
“ scorned to consult with his betters on what emer-  
“ gency soever; looked down with contempt on the  
“ most deserving of his profession, and never would  
“ confer with any physician who would not pay ho-  
“ mage to his superior genius; creep to his humour,  
“ and



“ and never approach him but with the slavish obsequiousness of a court flatterer.”

3. *The bacchanalian Doctor D.* given to sottishness, if not to drunkenness — generally somewhat of the Bully.

4. *The solemn Doctor. D.* with garb, voice, gestures, and equipage, contrived to overawe weak imaginations, and hide the futility of his art.

*Obs. 1.* D. of this remarkable species first practised physic with pomp: they invented or borrowed from the other professions those barbarous habiliments of which ridicule has but lately stripped physicians. In times when an huge wig, or a flowing gown, could more effectually command respect than sound morality, substantial justice, or useful skill, the stratagem succeeded to admiration.

*Obs. 2.* D. of this species, when a pretext offers, speak ostentatiously of their experience — never suspecting any of their hearers may know that there are understandings which multiplicity of appearances serves but to confound.

5. *The club-hunting Doctor. D.* frequenting the crowded haunts of men; pushing himself forward, saluting all he knows, and all who will know him; talking much and loud.

*Obs.* In England, D. of this species have of late been frequently seen in paroxysms of frantic loyalty, and of *civisme* in France.

6. *The burr Doctor. D.* fastening himself upon you as tenaciously as the heads of the noisome weed (*centaurea calcitrapa*) from which the trivial name of the sp. is taken, fix upon your cloaths.

*Obs.* Nothing in art, but the juggler's address in making you take what card he pleases out of a pack; equals the dexterity with which D. of this sp. force themselves on patients.

7. *The wheedling Doctor. D.* with an everlasting smirk upon his countenance — frequent at the polite end of large cities, and at places of fashionable resort.

Var. α. *The Adonis wheedling D.* D. with an handsome face, joined to the wily address, characteristic of the sp. — flourishes at watering places; sometimes joins to his profession the trade of a fortune-hunter; and if he succeeds, “ gives physic to the dogs.”

Obs. 1. D. of this sp. when most moderate, prescribe for every rich patient two draughts a day, and one night draught, besides pills and powders. Hence needlessly to swallow nauseous drenches may be numbered among the curses of wealth.

Obs. 2. *The Adonis D.* has sooner or later a patient of note, ill of a fever or some disease, that usually terminates favourably; in case of recovery the female busy-bodies of the place, exert their spirit of cabal in behalf of the wonder-working youth, and his fortune is made.

8. *The case-coining Doctor.* D. publishing forged or falsified cases.

Obs. “ A very fertile source of false facts has been  
“ opened for some time past. This is, in some young  
“ physicians, the vanity of being the authors of ob-  
“ servations which are often too hastily made, and  
“ sometimes, perhaps, very entirely dressed in the closet.  
“ We dare not at present be more particular; but the  
“ next age will discern many instances of perhaps the  
“ direct falsehoods, and certainly the many mistakes  
“ in fact, produced in the present age, concerning the  
“ virtues and powers of medicines.” CULLEN. *Mater. Med.* I. 153.

A-kin to this flagitious abuse is the practice of purchasing false attestations, on oath, for advertisements; and what is still worse in effect, though not in intention; a custom beginning to prevail among persons of distinction — who cannot be supposed capable of discriminating diseases, or deciding on the efficacy of drugs—but who, nevertheless, permit Quacks to use their names in testimony of cures, which they *suppose* themselves to have witnessed.

9. *The*



9. *The good-sort-of-man* DOCTOR. D. a good sort of man, armed, by some mistake, with a diploma.

Var. α. *The gossiping good-sort-of-man* D. fetches and carries scandal.

Obs. Varieties numerous as the hues of the camæleon.

10. *The Sectarian* DOCTOR. D. dwelling among his own people at first; and by them often pushed on to spread devastation among the rest of mankind.

Obs. Varieties manifold; each distinguishable by the livery of its sect — one is too curious to be omitted.

Var. α. *The inspired Sect* DOCTOR. D. believing himself to be inspired with the knowledge of diseases and remedies.

In civilized countries not much more frequent than witches. Among rude tribes, as among the Tartar hordes, a kindred variety is universally found. See Gmelin's Travels. But these seem rather to pretend to inspiration, than really to believe that their deity serves them in the capacity of prompter: and they conjoin the characters of priest and conjurer with that of physician. I have not been able to ascertain whether our variety receives the afflatus, except in its medical capacity: and the miracles it has wrought in this, are not so perfectly authenticated, as to silence cavillers.

Obs. People are now-a-days delicate in giving recommendations on some occasions; but the best bred persons make no scruple of pressing a favourite physician or apothecary upon their acquaintance. Yet one would think that they are nearly as competent to speak to the merit of a footman, as of a prescriber or compounder of drugs. Sects sometimes improve this propensity into a regular system of cabal. The deeper the hypocrisy, or the wilder the enthusiasm of the Sect. Doctor, the more eagerly will his brother fanatics dash through thick and thin to serve him. Now, as belief or disbelief in certain points of theology has no apparent connection with skill in the administration of

antimony, mercury, opium, and bark, we may deduce from this fact a rule which is probably as little liable to exception, as any that may be laid down on the whole subject. *Never call in a physician, BECAUSE he is recommended by a person of the same Sect; the more you are urged, be the more on your guard against the snare.* This rule extends to all demoniacs possessed by the *corporation-spirit*, and to all sets of persons remarkably gregarious.

*Obj.* Concerning this decalogue of doctors, there remains a caution to be laid down; and that it may make the greater impression, I shall deliver it in the style of my models, the naturalists. *Notandum in toto hoc genere naturam mirabiles edere lusus.* It is indeed applicable to all the species; individuals being apt, like hybrid plants, or mule animals, to exhibit the marks of two species, wholly or in part.'

We would suggest to Dr. Beddoes the publication of his preface and observations, separate from the work itself, at a moderate price: as it is probable they would be purchased by all those at present in possession of the *Elementa Medicinæ*; and would ultimately recommend the present edition. In this way, perhaps, the benevolent ends proposed might be in some degree promoted.

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Art. XV. *A New Inquiry into the Suspension of vital Action, in Cases of Drowning and Suffocation.* By A Fothergill, M. D. F. R. S. &c. 8vo. 189 pages, price 3s. 6d. boards. Rivingtons, &c. London. 1795.

THE attempt of the author in this publication is, as he expresses it, to concentrate into a more luminous point of view, the scattered rays of science, respecting that interesting, though mysterious subject: to elucidate the proximate cause, to appreciate the present remedies, and to point out the best method of restoring animation. It should be observed, that the



the observations of the author are not founded on experiments conducted by himself, but are inferences drawn from such experiments of others as have been heretofore given to the public. They contain an answer to the following questions, proposed by the Humane Society in the year 1792, and which they deemed worthy of the gold medal. 1. "*What is the proximate cause of death in the various kinds of suffocation?*"—2. "*What are the most judicious means to restore animation?*"

The first section contains observations on life, and the comparative faculties of man and other animals. These, as purely metaphysical, and having no relation to the general subject, we shall pass over. In the next, he inquires whether the vital principle be confined to the blood or any particular organ; and this he answers in the negative. Vitality he seems to consider as consisting in irritability. This inherent property renders it susceptible of being excited into action. In addition to this, he observes, organic life further requires an harmonious arrangement of parts, and the influence of stimulating fluids specifically adapted to the respective organs, in order to produce the functions of an animated being.

The appearances which are observed to take place on suspension of life, by drowning, hanging, noxious air, and smothering, form the subject of the third, and the three following sections. 1. 'When an animal is kept under water, it presently begins to expel air forcibly from its lungs, in form of bubbles, which rise to the surface. This is followed with a strong desire to draw in air, and in this effort it commonly inspires a small portion of water. Air is again emitted, and new efforts made to inspire, and that with similar effects. This is continued with increasing uneasiness from two minutes to five, when respiration ceases, faint gaspings succeed, and it sinks down motionless. Upon taking it out of the water, soon after all its struggles are over, the nose and mouth appear extremely pale, the eyes do not protrude, the pupils retain in some measure their  
natural



natural lustre, but are remarkably dilated. All sense and motion, both external and internal, except a feeble contraction of the right side of the heart, are now lost, and if suitable means of recovery be not made use of, the body gradually becomes cold, and with the loss of heat, the heart by degrees loses its powers of contraction.

2. ' On opening the chest, the cavities of the right side of the heart, with the corresponding veins, are found to be distended with dark coloured blood through their whole course. The left side of the heart is often almost empty: also the large arteries, except the trunk of the pulmonary artery, where it enters the lungs, which is commonly full of blood. The vessels on the surface of the body appear empty, and the skin as pale as if the animal had been bled to death.

3. ' The lungs often appear unaltered, sometimes in a collapsed state; but if the animal is often suffered to rise to the surface of the water, so that he may inspire air, that organ appears distended. A quantity of frothy fluid, consisting of air and mucus, with a little of the water in which the animal was drowned, may generally be squeezed out of the windpipe. But this is small in proportion to the quantity of air apparently expelled during the act of drowning, though it is more distinguishable when the animal is drowned in ink, or any coloured fluid. The orifice of the windpipe being endowed with exquisite sensibility, the animal, as if conscious of the presence of an improper element, rejects it with a convulsive kind of horror. These efforts to exclude water, and draw in air, are alternately renewed till strength is exhausted, and respiration ceases. Hence the fruitless struggles, which the animal exerts till it finally expires. After which, no more water probably is admitted; otherwise after the body has lain some time immersed, we should find the lungs fully distended, which is contrary however to observation; for it often happens, that no water can be discovered in the lungs of drowned animals. From the painful sense of irritation



tation which is felt on a single drop of water, or other liquid accidentally falling into the windpipe, and from the convulsive motions which ensue till it is expelled, we may form some idea of this distressing situation.

4. ' In drowned animals, the heart retains its motion longer than any other part of the body. The motion of its right cavity survives that of the left, and that of the latter holds out longer than the peristaltic motion of the intestines, inasmuch that a weak pulsation of the right chamber of the heart often remains upwards of two hours after respiration has ceased.

' On opening the head, the veins sometimes appear rather distended, yet seldom more than in other violent deaths, but without the least appearance of extravasation.

' Upon the whole it appears, that in drowning, the organization of the principal parts remains entire; but that the heart, and large veins in its neighbourhood are distended with dark coloured blood, whilst every other part seems in some measure to be drained of that fluid. Nor does the apparent fulness of certain vessels in the brain, the blood-shot eye, the bloated countenance, or the lividity of the skin, so often observed in drowned persons, who have remained long under water, especially with their head downwards, prove any thing more than that the blood after death had descended by its specific gravity to the more depending parts.

5. ' It appears from experiments, that when an animal is suspended by the neck, it generally ceases to struggle in about five minutes. The external veins of the neck being strongly compressed, the return of the blood from the brain is partially interrupted, but continues to circulate in the internal vessels while the action of the heart remains. The windpipe being shut by the pressure of the cord, and the ingress of air excluded, the eyes become prominent, the countenance grows first red, then livid, and suffocation ensues.

' On inspection of the body after death, the blood-vessels of the brain and its membranes seem rather more distended



distended than in the preceding case; the lungs very little altered, and free from frothy fluid: the heart and trunks of the larger vessels exhibit exactly the same appearances as in drowned animals.

6. ‘ The bodies of animals suffocated in noxious vapours, or killed by a stroke of lightning, exhibit the following appearances. Their limbs remain flexible long after death, except they are killed by nitrous air; in which case, they are said to become sooner rigid than those destroyed by drowning; and that, sometimes, even before the heart ceases to vibrate.

‘ The eyes retain their lustre, and the body a degree of heat often higher than the natural standard. This is particularly observed of those that are suffocated by the fumes of charcoal; and their blood, for several hours after death, remains fluid, and even highly florid. In those suffocated by fixed and inflammable air, although the limbs continue pliant, the blood is less florid. In all; the vessels of the brain are found turgid, the lungs little altered, the heart and adjoining vessels equally distended as in those that are drowned or hanged.

‘ In cases of suffocation, the body is often found warmer than natural, the limbs pliant, the lungs nearly natural, the cavities of the heart and large blood vessels distended with dark coloured blood. In other respects, the appearances are exactly similar to those occasioned by drowning or by noxious air.’

The author next treats of the properties of vital air; the nature of respiration—its effects on the blood—and its importance to life: of animal heat—its source—uniformity—and connection with respiration. On these subjects we find nothing new offered. He in the next place discusses the important question of the proximate cause of death, in cases of drowning and suffocation. On this subject he observes, that whether death is brought on by submersion, strangulation, or noxious air, the visible effects produced on the vital organs are so nearly similar, that these several modes of suffocation may perhaps all not improperly be referred to one common cause.



In cases of drowning, M. Louis, De Haen, and others, consider the introduction of water into the windpipe as the immediate cause of death. But experiments have shewn, that two ounces of water — a quantity, perhaps, greater than is commonly found in the lungs of drowned animals, may be injected into the windpipe without proving fatal. Other eminent writers have endeavoured to explain the death of drowned, or suffocated animals, from a surcharge of blood in the vessels of the brain; and have therefore considered it as a case of real apoplexy. Among these may be mentioned M.M. Littre, Wepfer, Boerhaave, Cullen, and lately Mr. Kite, in his essay on this subject. To this opinion Dr. Fothergill, however objects. The distention of the blood vessels of the brain, observable in these cases, and particularly after strangulation, affords, he thinks, no convincing proof of apoplexy, since a variety of other instances of violent death present similar appearances, even where there could be no suspicion of the brain being overcharged: and it is not even pretended that in violent death, produced by drowning or suffocation, any extravasation of blood or serum has ever yet been discovered in the cavities of the brain, though generally very conspicuous in fatal incidents occasioned by genuine apoplexy. Further, it appears from the experiments of M. Emmettus, that all the larger veins of the neck, both internal and external, have been separately tied, without apoplexy, or even sleepiness, being induced. It is likewise related, that the carotid arteries and jugular veins being *all tied* in a dog, that he enjoyed the most perfect health and vivacity for some weeks.\*

Nor does diminishing the quantity of blood, conveyed to the brain, retard the fatal event. ‘ The windpipe of a dog was secured by a ligature at the instant of inspiration; in less than four minutes he ceased to struggle. The blood in the left side of the heart, compared to that of the right, was as 13 to 12. The veins of the head were evidently less distended than natural. Here then,

\* Kite's Essay on the Recovery of the Apparently Dead, p. 139.

then, there being no obstruction to the passage of the blood through the lungs, it could not be collected in the right side of the heart, and consequently *no* accumulation was found in the head; and yet this animal died as soon as others, from ordinary hanging.

‘ Again — ‘ The two carotids of a dog were secured (which we now know may be done without materially injuring the functions of the animal); in half an hour after this operation he was hanged. In less than four minutes he ceased to move. The vessels of the brain were much less distended than in ordinary death. Here the principal supply being cut off, instead of the vessels of the brain being in a state of congestion, contained a much *less* quantity than natural, and consequently no species of apoplexy could follow from *distention*; and yet this animal died as soon as others which had undergone no such operation.\*

‘ The following experiment, by that eminent anatomist, professor Monro, evidently proves that, in hanging, death is not produced by apoplexy, but a very different cause.

‘ A dog was suspended by the neck with a cord; an opening having been previously made in the windpipe below the cord, so as to admit air into the lungs. In this state, he was allowed to hang three-quarters of an hour, during which time the circulation and breathing went on without being much interrupted by the experiment. The cord being now shifted *below* the opening into the windpipe, so as to intercept the ingress of air into the lungs, and the animal being again suspended, was completely dead in a few minutes.’

Another opinion on the immediate cause of death, is that it is owing to the presence of black blood in the left side of the heart, and its vicinity.† This blood being deprived of the influence of the air, is supposed to be now rendered incapable of exciting the action of the heart. But it is found, that the heart, instead of  
instantly

\* Coleman’s Dissertation on Suspended Respiration, p. 137-139.

† Godwin on the Connection of Life with Respiration.



instantly stopping, continues to contract a considerable time after the blood has acquired this dark colour.

“ The *proximate cause* of that disease, produced by drowning, hanging, and suffocation,” says another late writer, “ appears to be mechanical obstruction in the interior pulmonary vessels, from *collapse* of the lungs, with a want of latent heat in the blood.”\* But in the experiment above related, where the windpipe was tied after inspiration, no collapse of the lungs could take place; and, with respect to a deficiency of latent heat in the blood, Dr. F. replies, that a violent flash of lightning, the fumes of charcoal, or of burning sulphur, cause immediate death or suffocation, without extinguishing animal heat, which rather increases, and continues several hours.

Rejecting, therefore, all these theories, the author offers his own; which is, that the immediate cause of death is the *privation of vital air*.† ‘ This animating fluid, says he, derived from the atmosphere, being proved essential to respiration, and respiration to life, leads us to trace the following chain of causes and effects, which in the act of drowning or suffocation of necessity follow each other in rapid succession. No sooner is the vital air excluded, than respiration is suspended; respiration being suspended, the passage of the blood through the lungs is intercepted, and of course through the whole system. The action of the heart being impeded by the same cause, the circulation is suppressed. The brain, unsupported by the circulation, being unable to exert its influence, the mental and corporeal actions cease, and the mind is no longer conscious of the state of the body. The blood being deprived of its power of generating heat, a coldness diffuses itself over the system. Unless aid be now properly administered, the principle of irritability gradually forsakes the fibres, first in the extreme parts, afterwards in the heart itself, when the animal dies.

“ From

\* Coleman on Suspended Respiration.

† This is probably what Mr. Coleman means by the deficiency of latent heat.

“ From an attentive consideration of the various phenomena thus brought into a small compass, the order in which they succeed one another, and the effects which ensue, does it not appear evident that, in these different species of suffocation, the EXCLUSION of VITAL AIR from the lungs is the primary cause of suspended respiration, and that suspended respiration is the immediate cause of the suspension of the other vital actions? But since vital action may be suspended by various causes, without being extinguished, it is now well known, that persons labouring under such a state of suspension, may often yet be recovered by renewing the action. Such a critical situation, however, may not improperly be considered as an intermediate step between life and death. If to this succeeds the EXTINCTION of IRRITABILITY, or of that oscillatory principle (whatever it may be) which renders the heart and muscular fibres SUSCEPTIBLE OF STIMULUS, it constitutes the PROXIMATE CAUSE OF DEATH.”

The two following sections are employed on the subject of vital air—its extensive influence in the animal œconomy—and in the inquiry whether it be the source of irritability in all organized bodies. Having stated that the nervous influence, vital principle, or, as Dr. Darwin expresses it, the spirit of animation, cannot be a secreted fluid, since the brain is no longer allowed, by anatomists, to be a secretory organ, the author asks, “ Must it not be referred then to vital air or spirit of the atmosphere, emphatically termed in the sacred page, the “ BREATH OF LIFE,” and by ancient philosophers, “ *Divinæ particula auræ.*” drawn into the lungs at the first effort of respiration? Is this received in form of heat, light, or electricity? Or, to speak more philosophically, is it that subtile fluid, which fills universal space; pervades all bodies; and actuates every particle of matter; of which, heat, light, and electricity are only effects, or different modifications of the same cause?”

We



We confess we do not feel inclined to follow the author in such a maze of hypothesis.

On the subject of prognosis the author observes, that “If the eyes appear clear, the pupils not greatly dilated, nor totally void of contraction, on being approached with a lighted taper: If the external muscles can be made to shew visible contractions by electricity: and, finally, if the surface of the body retains perceptible warmth, we may conclude, though every other appearance be unfavourable, that sensibility and irritability have not wholly forsaken the vital organs, and consequently that there are still some hopes that recovery may be effected.”

From the experiments of Mr. Kite on drowned animals it appears, “that after the strugglings had ceased from the space of one minute to four, if they were exposed to the open air, they soon recovered spontaneously, but seldom, or never after the sixth or seventh minute. By imitating natural respiration *alone*, he was able to restore some animals after eight, ten, or twelve minutes submersion, but candidly acknowledges, that this operation, though performed with great attention, often failed; while other animals, that had been immersed longer, recovered spontaneously. He further adds, that if it be not attempted before the convulsive motions of the animal cease, which, on an average of many experiments, happens in about eleven minutes and a half, it will not be sufficient to renew the vital functions.”\*

With regard to the treatment necessary to be adopted, the author remarks, that in all successful cases, the first efforts towards recovery begin in the organs of respiration, such as a tremulous motion of the lips, convulsive sobbings, with other imperfect attempts towards breathing; next, a deep inspiration, with an obscure motion of the heart; and then the other functions gradually followed in succession, but not till respiration was restored. Hence, and in conformity with the proximate

\* Memoirs of the Medical Society of London. Vol. 3. p. 297.

proximate cause, as assigned by the author, he is led to form his indications as follow. 1. *To renew the action of the lungs, in order to open a free passage to the blood through that organ: And, secondly, To excite the energy, or propulsive power of the heart, in order to enable it to overcome the resistance.* He then enquires into the respective merits of the different means in use for fulfilling those intentions.

*Venæsection*, it is evident can make no part of the author's plan. As it can have no direct tendency to restore respiration, and instead of increasing the action of the heart, and energy of the brain, has a manifest tendency to weaken both, he infers, that unless we resolve to hazard the feeble remains of life, (to support which our utmost exertions should be directed,) we must forbear this operation, at least till the circulation be restored. *Emetics* are also objected to on the same grounds.

Inflation of the lungs, by artificial respiration, constitutes the first and most important operation; and for this purpose vital air is recommended, consonant with the author's theory. Electricity is also recommended, in conjunction with artificial respiration.—‘As soon as the lungs therefore are fully expanded with air, (and the more *pure* this is, undoubtedly the better,) at that moment, let the heart be excited by a gentle electrical shock, passed obliquely from the right side of the chest through the left, in the direct course of the heart and pulmonary vessels. Let the lungs be now emptied of the air, and again expanded, when another shock may be given. The heart being thus excited into action, the dark blood, loitering near its right cavity, will begin to move forward, and to resume a more florid colour. This being gradually renovated, will renew the action of the left ventricle, when the circulation will also be speedily restored, and that perhaps, with more certainty and expedition, than by the usual mode of conducting the operation.

‘The



‘ The longer respiration has been suspended, and the more the vital powers are enfeebled, the more gentle ought to be the means of restoration. In which case, it may be prudent to begin with moderate vibrations, or very slight shocks;\* and instead of repeating them at every inspiration, to postpone them to every second or third successive expansion of the lungs. For it will be safer to keep pace with the slow and languid movements of the heart, than to waste the small remains of irritability in fruitless exertions.

‘ The course of the electric circuit may also be properly varied, directing it alternately from right to left, and from left to right; particularly through those parts that are known to retain irritability the longest; as the heart, the diaphragm, and alimentary canal.

‘ Gentle shocks may also, at intervals, be transmitted along the whole course of the spine.’

On the article of heat, the author observes, that heat is essential to animal and vegetable life, and therefore, has been employed as one of the most powerful means of restoring animation — that it requires, however, much caution, and seldom succeeds alone, unless respiration be previously restored. — that it ought to be carefully regulated by the internal heat of the body: that, instead of artificial heat, the Russians apply snow or cold water to the apparently dead body — that this cooling method, however paradoxical it may appear, is nevertheless attended with surprising success, particularly in cases of suffocation from noxious air — that the usual methods of communicating heat are very uncertain — that the temperature is fluctuating, sometimes too little, often too great, and that it ought to be adjusted by the thermometer.

With regard to the other methods of treatment, he observes, ‘ That *agitation* of the body has alone some-

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times

\* By placing the electrometer at first only a quarter of an inch from the coated jar, and by gradually increasing the distance, if no sensible effect be produced. It can scarcely be necessary to remark, that the discharging rods must be *insulated*, otherwise shocks may inadvertently be communicated to the operator.

times succeeded in restoring vital action — that it affords a speedy mechanical stimulus to the whole frame — that it is easily performed by the common people.

‘ That *friction* also, under due regulation, is a very useful auxiliary in stimulating the cutaneous nerves, and in expediting the motion of the blood towards the heart — that the rough manner in which it is often conducted may prove mischievous — that saline, spirituous, or unctuous substances, instead of increasing, tend to diminish its efficacy — that it may be best performed with the hands, or flannels impregnated with the fumes of gum benzoin.

‘ That a stimulating cordial is highly necessary — that it may be safely conveyed into the stomach without occasioning any danger of suffocation — that spirituous liquors, being exhausting stimuli, are less proper than generous wine, with the small addition of some cordial tincture, or volatile alkaline spirit.

‘ That stimulating *enemas* are also indicated — that their effects, like those of cordials, are propagated to the other vital organs by sympathy — that the *tobacco* enema appears to be a doubtful remedy, though not so dangerous as some imagine — that while it is condemned by some, it is ably defended by others — that the case remains *sub judice*, and waits the result of future experiments. — That in the interim, *warm vital air*, and other stimulants of a less equivocal nature, might deserve a trial.

‘ That *stimuli*, adapted to the *organs of sense*, may prove useful auxiliaries, and afford a test whether any degree of sensibility remains — that next to electricity, the pure *volatile alkaline spirit* appears to be the most active.’



Art. XVI. *Essays and Observations, physiological and medical, on the Submersion of Animals, and on the Resin of the Acoroides Resinifera, or Yellow Resin, from Botany-Bay. To which are added, Select Histories of Diseases, with Remarks.* By Charles Kite. 8vo. 423 pages, price 5s. Dilly, London. 1795.

THE essay on the submersion of animals, having already appeared in the Memoirs of the London Medical Society,\* we shall content ourselves with briefly noticing the general ideas of this part of the book. It is universally allowed that the death of drowned animals is to be attributed to the water intercepting the action of respiration. but the manner in which this suspended action operates, in producing the fatal issue, has occasioned much difference of opinion. To those that suppose death is occasioned by the want of pure air in the blood, from the obstruction to respiration, Mr. Kite replies, 1. ' That the left auricle and ventricle of the heart do not cease to contract *in consequence* of the black colour or phlogisticated blood in their cavities; because it appears, from experiment, that they really do contract, and with a considerable degree of force, for some time after the blood has acquired its black colour. 2. That the intellectual operations *do not cease*; that sensation and voluntary motion *are not suspended*; and that the external signs of life *do not disappear in consequence* of the sinus and auricle ceasing to contract, because the sinus and auricle continue to contract a considerable time after those changes have taken place. 3. That it does not appear that the blood's being restored to a florid colour in the left side of the heart, and that side's retaining the faculty of contraction, are the only conditions requisite for the recovery of drowned animals; because animals do not in many instances recover when this colour of the blood is restored, although the contraction of the heart continues. 4. If the black colour, or phlogisticated

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state of the arterial blood, is the cause of the death of drowned animals, it may just as readily exert a sedative effect, as be an insufficient stimulus ; under either circumstance, all the different viscera in which this blood is present, appear liable to be affected by want of the salutary action of the florid blood as much as the left auricle and ventricle ; and it does not appear, when their various functions are in this manner once suspended, how they can be renewed by altering the property of the blood in the pulmonary artery and pulmonary vein. 5. If the death of drowned animals be occasioned by the black blood in the left auricle and ventricle, it would be impossible that any animal should recover till the property of the blood is changed by inflating the lungs ; the contrary of which is very generally known. 6. It does not appear that the death of drowned animals is occasioned by “ black blood in the left side of the heart and arterial system,” because many instances have occurred where the same appearances have been observed in persons who have suffered a very different kind of death : where, in diseases, the blood has appeared to possess an equal degree of blackness, accompanied with strong action of the heart and arteries, and deep regular and uninterrupted respiration : and where, in a state of health, the vital, natural, and animal functions have been continued, notwithstanding there was a considerable alteration in the colour of the blood.

‘ From the whole of these observations I draw the following conclusion :

‘ That the suspension of the action of respiration does not induce a stoppage of the circulation and its necessary consequences, by chemically depriving the blood of certain properties which it should acquire from the air in its passage through the lungs.’

He next proceeds to inquire, whether the suspension of respiration induces a stoppage of the circulation, and its necessary consequences, by mechanically obstructing the passage of the blood through the lungs? Here  
he



he observes, that the lungs of drowned animals are in a state of perfect and complete expiration; and that, in this state, only a small quantity of blood can pass to the left sinus and auricle. If the stoppage of the circulation first takes place in the pulmonary artery, it follows, that the blood returning from the various parts of the body, should, in consequence thereof, be accumulated in the right ventricle and auricle, in the sinus venosus, and in the great veins immediately connected with them: and this the author has found to be universally the case. This congestion of blood on the right side of the heart he supposes to occasion death, by impeding the return of the blood from the brain, and hereby occasioning apoplexy to take place. That this affection really takes place, he infers first from the appearances which present themselves. “The face is remarkably swelled; the eyes violently suffused with blood, enlarged, prominent, and sometimes so protuberating that the eyelids seemed insufficient to cover them; the features of the countenance are generally distorted; and the tongue, in part, thrust out of the mouth.” We regret that the appearances on dissection are not sufficiently clear to render the conclusion indubitable. “Extravasion does not,” observes the author, “in healthy animals, take place in any part of the brain; but there is a considerable fulness or distention of the veins of every part of that organ. The heads of various animals were examined likewise, by several friends at my request, and a *certain degree of fulness, I was informed, always occurred.*”

On the supposition, therefore, *that those who die by drowning, die in consequence of an apoplexy, or a compression of the brain*, the chief indication in the treatment will be — to remove the compression of the brain, and the distention of the right auricle and ventricle, and of the great veins connected with them; and this will be best effected by again opening a passage for the blood through the lungs, by distending them by artificial respiration. Bleeding in the external jugular veins, like-

wife, must tend to lessen the quantity of blood in the brain, and consequently the compression of that organ; Mr. Kite therefore advises to have immediate recourse to that operation in all cases, and particularly in those where the external appearances of distention are violent.

Upon the whole this is certainly a very ingenious performance; it is, however, to be lamented, that notwithstanding the subject has engaged the attention of many able men, so important a point as the proximate cause of death in cases of drowning, &c. should not yet be ascertained with certainty. Were it a matter of speculation only, it would possess little relative importance. But unfortunately practice is very materially influenced by every error in medical theory. Thus, for example, those who attribute death to the want of the necessary chemical change taking place in the blood, can of course see no utility in an evacuation of this fluid: whilst those, who, with Mr. Kite, suppose the patient to die apoplectic, naturally look for immediate and essential relief by having recourse to venæ-section. In this dilemma what is the mere practitioner to do? He must of necessity be guided by former experience, and this undoubtedly is in favour of bleeding, and some other means, which theory has taught many at present to reject. If such be the state of the science at the present day, it may be fairly asked, what benefit has arisen from the establishments which have made so much noise in various parts of Europe? It does not appear that the present practice is a whit more successful than that of preceding times; on the contrary, there is reason to fear, lest the bias of theory may have led many to neglect those means of recovery which successful experiment had before approved. Another objection, and a very weighty one it is, may be made to those societies; that by referring so much to art, and applauding so highly the merit of medical practitioners, the public have been led into a belief of the inefficacy of all means which are not directed and overlooked by the



the faculty; and thus those first moments have been lost, in which the chance of recovery perhaps alone existed.

The second Essay, containing an account of the medicinal effects of the yellow resin of Botany Bay, we have already noticed;\* likewise those on small-pox, and an account of a rupture of the gravid uterus, terminating favourably.† The next is a case of an unusually large abscess, seated between the peritonæum and abdominal muscles, from which the matter appeared to be discharged, sometimes by the external opening, and at other times by expectoration. This is followed by an account of an extraordinary disorder, in which the patient, after suffering amputation of the thigh for a carious ulcer of the leg, was at different times attacked with the same painful sensations, and which, as she imagined, occupied exactly the same place as before the limb was removed. Relief in this case was afforded by pretty large doses of opium, although the affection continued to recur for several years. We have next a case of cataract cured by the application of electricity; and two cases of paralysis of the inferior extremities, arising from curvature of the spine, cured by issues.

The account of the beneficial effects of a very liberal and long-continued application of cold water, in a case of strictured hernia, we shall give at length. “—Everest, about thirty-five years old, had had a scrotal hernia several years, but as it usually returned into the abdomen, on laying in bed, and was seldom materially inconvenient to him, he had never applied a truss, or paid any particular attention to it. One day, however, soon after dinner, he was attacked with a very severe pain in the part; inflammation and tension came on, and a medical gentleman was immediately sent for—the symptoms had increased so rapidly, and the man already in so alarming a state, that he called in another; and not long

\* Vide Med. Review for March, vol. i. page 453.

† Ibid. page 494 and 496.

long after I was sent for, and I saw him about six hours from the first attack.

“ There was greater tension and inflammation over the whole scrotum than I had ever seen in any case before — it was so much enlarged that the penis was entirely hid, and so exquisitely painful, that he could scarcely bear it to be touched.

“ Before I saw him, he had been bled, and had taken several purgations. Warm fomentation had been applied, and the tobacco glister had been injected.

“ I immediately gave him an opiate, and placing him almost upon his head, I made a gentle attempt at reduction, but without the least prospect of success.

“ I was thoroughly satisfied that no remedies whatever, short of the operation, would be productive of the least advantage, except it was a very liberal application of cold water; and from the many instances I had seen of its good effect in herniæ, and in constipated bowels, I determined to give it a fair chance for the space of three hours; although, from the very unusual severity of the symptoms, relief was scarcely to be expected from any thing but the operation; and this we agreed to perform as soon as it should appear that the cold applications did not produce the desired effect.

“ With this view, sheets were thoroughly wetted with water, artificially cooled by the neutral salts, and dashed over the scrotum, abdomen, and thighs — and they were repeated every two minutes for three parts of an hour, without any other effect than that of abating the intensity of the pain.

“ As this was what might be called a very fair trial, I began to despair — it occurred to me however, that in the most obstinate case of obstructed bowels, I had ever witnessed, the patient did not experience relief until he was weakened and lowered to such a degree by the cold applications, that prudence prevented its further continuance — I resolved therefore, in the present instance, to pursue the plan to the same extent as in that case.

“ Five



Five or six pails-full of water, fresh drawn, were ordered into the apartment; the patient was laid on his back over a tub, large enough to receive the water: one or two garden watering pots were filled with the water, and the contents of one of them poured over the scrotum: as soon as it was emptied another was used in the same manner, and this process was repeated until the patient WAS SO MUCH CHILLED, AND THE POWERS OF LIFE SO MUCH REDUCED, that it was thought proper to desist: — at this time the tension of the scrotum was taken off, the parts became corrugated, and with the most trifling assistance, the hernia was reduced.”

The beneficial effects of the same application were equally observable in the following instance. “ Daniel Donaldson, of a strong, robust constitution, forty-eight years old, and formerly a sailor, till October, 1785, enjoyed a good state of health; but at that time while he resided in a workhouse in some part of Lincolnshire, was seized with an irregular intermittent. It continued about three months, and then, by taking a very few medicines, (among which he does not believe there was any bark) it left him. From this period he dated the origin of his complaint; for soon after he was subject to pains in various parts of the abdomen, but more especially in the left hypochondrium, and round the navel. When the pains were violent, the part affected became swelled, and the bowels were costive; but on stools being procured, he immediately grew easy, and the swelling disappeared. He soon perceived that when a sufficiently large quantity of fæces was accumulated, the same symptoms returned, and he was obliged to have recourse to salts, or some other purging medicine, in order to obtain stools. In this manner he was generally attacked once every four or five days; but as the remedies he commonly made use of had always given a temporary relief, I was not desired to see him till the 23d of March, 1786, when he was  
taken

taken much worse, in consequence of the medicine having failed in producing its usual effect.

“ The pain, with some degree of tension, was general all over the abdomen, but immediately below the naval it was more severe. At this part there was a considerable swelling, which at first seemed a contraction of the abdominal muscles, but afterwards it appeared more likely to be a collection of air or fæces, confined in some part of the bowels. He had passed no stools for about a week, and his urine had been made frequently, and in small quantity ; but there was no great appearance of inflammation or fever, for no rigors had attended ; the pulse was scarcely altered from a healthy state, and yet he was not attacked either with sickness or vomiting.

“ Previous to my seeing him he had taken three ounces of salts, which had produced no effect ; a strong dose of jalap and cream of tartar was then given, with no better success. Extract: cathart: and calomel having given relief in a former fit, were now exhibited in large quantities, but with no advantage ; at the same time clysters were had recourse to, which sometimes were retained, but frequently voided in the same state as when injected. It seems unnecessary to specify every particular remedy which was made use of. It will suffice, perhaps, to mention, that after bleeding, the purging salts, infusion of senna, jalap, extract: cathart: calomel, castor oil, &c. were by turns employed ; and as they occasioned neither sickness nor increase of pain, they were all given in much larger doses than I had ever ventured on myself, or than I had known given to others. The clysters were emollient, oily, and purgative ; sometimes they were formed with a solution of turpentine, and frequently with a strong infusion of tobacco: the usual quantity of each clyster was a pint ; this was ordered to be forcibly injected through a pipe with a bore larger than usual.

“ The state of the inferior part of the rectum had previously been ascertained, but I now thought it advisable



viseable to examine whether any constriction existed in the lower part of the colon. With this intention, a candle, nearly a foot in length, was carefully introduced, but not the least obstruction was perceived: it was, however, suffered to remain till the tallow melted; and conceiving some benefit might arise from a soft substance lying some time in the part, this remedy was again repeated.

“ The warm bath was used; but it was evident he was in much greater pain while in it than before. As soon as he came out, a clyster of the fumes of tobacco was blown up the rectum: he was again put into the bath; and while in it another smoke clyster was injected, and one more was repeated when he came out from it.

“ The same day a small quantity of cold water was sprinkled on his legs and arms, while he lay on a blanket in a warm room; but the next he was supported on the cold stones of a washhouse, perfectly naked, and this during a severe frost, while a pailful of cold water was, at different times, dashed over his legs and thighs, and poured down his arms. This, instead of increasing the pain, as the warm bath had done, made him much easier, the relief, however, was but of short continuance, but it was the only effect it produced.

“ The day following, after a tobacco smoke clyster had been given, he was sick and vomited much. What he brought up tasted powerfully of the tobacco, and bore an exact resemblance, both in appearance and smell, to the liquid fæces which were forced from him by the violent effort of straining. Trivial as this evacuation was, yet, when the sickness had subsided, he thought himself easier for it; I therefore encouraged the vomiting, by giving half a scruple of vitriol. alb. every half hour till it operated; which it soon did, once or twice, and with similar effect.

“ Every measure had now been employed, from which I could suggest the most distant probability of success;

success; and the writings of the most eminent among the ancient as well as modern practitioners were in vain ransacked for new remedies.\* To those which I had used, a fair and unprejudiced trial had been given. In particular, a liberal and almost unrestrained use had been made of the strongest purgatives, opium, æther, injections of every kind, (amounting, in number, altogether to fifty,) electricity, the warm bath, the application of cold water;—remedies so justly extolled, and so much relied on in the advanced stages of these complaints,—but without the least success.

“ When I saw him on the fifteenth day of the disease, I found him in the following state:—The bowels continued obstinately constipated; the belly was hard, and immediately below the navel it was swelled somewhat irregular: the pain was violent, but tensive, at times remitting, and increasing much on pressure. The vomitings were frequent, sometimes of a slimy matter, at others stercoraceous, having both the smell and appearance of liquid stools.† The pulse was soft, weak, and irregular; the tongue brown, but moist; the eyes sunk in the sockets, dull and heavy; the breathing short, frequent, and attended with constant motion of the nostrils; the hiccup was frequent and harassing; his appetite and sleep had almost forsaken him; he had often a subfultus, sometimes a tendency to delirium, and his urine was scantily secreted, and frequently voided with some pain, depositing a copious brown sediment on standing.

“ The patient had hitherto sustained his complaint with great fortitude and resolution, and had suffered every plan to be put in execution with singular patience; but being now become sensible of his extreme danger, he was anxious and dejected; despair was settled

\* I must except quicksilver, against which the concurrent testimony of many respectable authorities, as well as common sense, militates so powerfully, that I did not use it.

† Once being sick after a tobacco smoke clyster, what was brought up he said, tasted strongly of tobacco; but I could never learn that any other clyster had a similar effect.



tioned in his countenance, and he requested he might be permitted to die peaceably. This was his situation, and so dreadful did it appear that an alteration for the better scarce entered my mind.

“ I join those in opinion who think it better, in desperate cases, to have recourse to doubtful or even dangerous remedies, than suffer the patient to be lost, without making use of any means to save him. Were we to observe this as an invariable rule; were we never to relinquish our attempts till they can no longer be employed, it would I am confident, be productive of many extraordinary recoveries. Every practitioner, who is guided by these sentiments, can, doubtless, bring to mind several instances wherein his apparently vain and fruitless perseverance has been crowned with the most unexpected success. The termination, however, of the present case is so decisively in point, that it is unnecessary to adduce any farther proof in support of the opinion.

“ Actuated by this principle, and revolving in my mind the effect of the various articles which had been used, I could but observe, that although no evacuation followed the application of the cold water, yet the patient was evidently easier after it; whereas quite the reverse was the case while he was in the warm bath; for he was then in greater pain than usual. This determined me once more to make trial of that remedy; but in order to derive any material advantage from it, I was persuaded it would be necessary to urge it to a much greater length than I had hitherto. This was accordingly done, and to such a degree, that nothing but the extreme danger of the patient could justify my having recourse to such desperate proceeding.

“ As he was now much too weak to be removed into the washhouse, he was supported, sitting on the side of the bed, with his feet in a tub. In this situation two or three pails-full of the coldest water were poured over his legs and thighs, so that his feet and ankles were of course constantly immersed in the liquid. This operation was perpetually repeated for the space of ten minutes,

minutes, when he was so much affected by the intense cold, that I judged it prudent to desist. He was wiped dry, and put to bed. Within the half hour, being then pretty well recovered, a pint and a half of cold water was injected by clyster, and almost immediately after wet napkins were applied cold to the whole abdomen, and renewed as soon as they became in the least warm. The effect of this treatment was so strongly marked, that it was really astonishing; for in a few minutes he had a profuse evacuation of uncommonly hard and large fæces, and this was followed by several thinner ones. He was now comparatively easy: the swelling and hardness of the belly was considerably abated; he had no farther return of the vomiting or hiccup; and there was every appearance of speedy recovery. The stools, however, notwithstanding they were passed in great abundance, did not seem sufficient to answer the intention completely. Several doses of senna and salts, with warm relaxing and purging clysters, were then again applied, but with no better success than they had been before. At the expiration of two days I was apprehensive our affairs were getting into the same channel as usual, in consequence of which I ordered the cold water clysters and wet cloths to be repeated; and allowed him to take half a pint of cold water every hour till he had taken a quart. These again procured a tolerably good stool, and I was in hopes that a proper repetition of purging medicines by the mouth and rectum would now be able to effect their purpose. Still, however, I was mistaken, and at the end of three days more I had the mortification to find his bowels were as obstinately constipated as at first.

“ Upon attentively considering the case at this period, it occurred to me that the first time the frigid operations were both internally and externally employed, the patient was extremely affected by the cold, and then a profuse evacuation took place; but the second time he seemed little affected by it, the evacuation was less, and it was longer before it was procured. This determined  
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me to proceed exactly in the same manner as I had done at first, accordingly two pails-full of water were poured over his legs and thighs till such time as he became extremely cold, and then the cold clysters and cold cloths were applied. The event now fully answered my most sanguine wishes, for a profuse evacuation ensued, and I had the pleasure the next morning to find a common purgative had operated freely, and that the intestines were now completely unloaded.

“ It may not be improper to observe, that, notwithstanding the enormous and uncommonly large quantity of purging medicines which he had taken, so far was a purging from ensuing, that it was necessary to continue their use, once in two or three days, for some time after the obstruction was removed.

“ In about three weeks after the patient had overcome this complaint, he became ascitic. As soon as this was perceived, diuretics of various kinds were had recourse to, particularly squills and foxglove, but without effect. Cream of tartar, in the quantity of an ounce, was given every day; blood and mucus were evacuated by it, but no water. Upon the presumption that the liver was concerned in the production of the disease, large doses of mercurial ointment, with camphor, were rubbed over the region of that viscus; and calomel, to the amount of six grains a day, was for some time administered; but, at the expiration of three weeks, the swelling had increased so much, and was so painful, that it was necessary to draw off the water. Nineteen pints were evacuated; on submitting part of it to a degree of heat sufficient to coagulate the serum, part of it only coagulated, and that in an imperfect degree. The foxglove was again had recourse to; one grain of the powder was given twice a day for a fortnight: it then occasioned sickness and slight vomiting, but no increase of urine. He was tapped several times; but that, and in short every other remedy, proved merely palliative: he struggled till the beginning of December, and then died.

“ I very

“ I very much wished to examine the state of the abdominal viscera after death; but several circumstances concurred in preventing me; I was the less anxious, however, about it, as in the space of near nine months he had no return of the stoppage in the bowels, except such as readily gave away to a mild dose of common physic.”

A remarkable case of recovery from drowning, is next related. The patient at the time of the accident was ill of a fever (*typhus mitior*) and is said to have been at least twelve minutes in the water, with his head under the surface. The application of warmth seems to have been the only material thing made use of for his recovery; but it is to be observed, that the first effort to breathe, was made during the agitation of the body occasioned by its removal.

Four cases of tetanus, trismus, and opisthotonos, two of which were successfully treated by opium and stimulants; the others terminated fatally under a similar plan.

Subjoined to the work, are some meteorological tables, which exhibit an accurate and comprehensive view of the variations of the barometer, thermometer, hygrometer, winds and weather; and the quantities of rain and evaporation in every month for nine years, from 1786 to 1794, inclusive.

Art. XVII. VERSUCH UBER DIE PFLICHT DER MENSCHEN, &c. *An Essay on the Duty of Men to separate persons infected with the Small Pox, from those in Health, thereby to effect the extirpation of that Disease equally from the Towns and Countries of Europe.* By B. L. Faust. Leipzig.

IT is certainly not one of the least important purposes of the art of medicine to prevent as much as possible the attack of disease, and it becomes the duty of every man to promote, as much as in him lies, this great



great object, none can well be considered as more sublime or important than the prevention of so destructive a malady as the small pox. This disease has now existed in Europe above a thousand years; it does not of necessity arise in the human species, but is of foreign introduction; and is equally malignant as at its first appearance; medical men should therefore unite their powers towards its extermination. Hufeland in Germany, was the first in modern times who moved and recommended it with warmth, and he has been followed and supported by Haygarth, who has not only shewn the possibility of it, *a priori*, but likewise that it has actually been realized in North America. In the present publication, M. Faust, in his peculiar and lively manner, points out this object as the duty of mankind. He enters largely into the proofs of its possibility. We shall first notice these, and then the objections which have been urged against them. The most weighty arguments, in favour of the practicability of eradicating this malady are the following. — 1. This is a new disease, unknown to the ancients, and introduced into Arabia from Africa; and thence propagated through Europe. There were still, in the present century, countries in both Europe and Asia, in which this disease was unknown. About the middle of this century it was carried to Iceland and Kamtschatka. It therefore does not necessarily arise, but is communicated by contagion; by which it is continued and produced anew. Man, therefore, and not the atmosphere, is both the vehicle and source; and it would not exist a moment, did we desist from imparting it and regenerating it anew.

2. The small pox is one of the most universal, painful, dangerous, and destructive maladies to which the human race is liable. By it a great part of mankind is disfigured and lose their health ever after. In many the mind and organs of thinking are deranged during life; and most probably, M. Faust says, a large part of modern diseases owe their origin to that destructive fire we have all passed. It is computed that a twelfth part

dies in the small pox ; and consequently Europe loses yearly by this cause 400000, and 40,00000 in a century. Moreover, it becomes a weighty object of financial consideration, when the loss of labour, expences of cure, and funeral, are considered ; to speak moderately, this may be estimated at a million annually for Germany alone.

3. It never owes its origin to any particular temperature of the air, but is always propagated by infection.

4. It is not propagated by the air, but by contact, or approaching its atmosphere, which is fully confirmed by experiment ; not by touching the sick only, but any thing which remained in contact with the sick, and to which the particles of the poison might adhere ; as clothes, &c. Thus it appears that this is not an unavoidable evil, more than any other poison, the means of imparting which is known to us.

5. The plague is in all those points equal to the small-pox, and consists in a peculiar animal poison ; is imparted by contact ; was formerly as frequent among us as it is now among the Turks, and is wholly extinct since our forefathers began to separate those that were infected, and since we continue to oppose its admission into our countries, by cordons and quarantines. The same is true of the leprosy. But the chief argument is, that the attempt to extirpate it has effectually succeeded. The isle of Rhode Island, in which those maxims were followed has, since that time, never had the appearance of it. The city of Chester has remained free in the midst of an infected country, and it has been equally so at St. Helena and New England.

Thus it is proved, that the small pox is not a necessary or unavoidable evil of mankind : it can be annihilated, and ought to be : it is a sacred duty to deliver from its ravages the present and future generations, we commit a heinous crime in not using the means in our power to put an end to so dreadful an evil. The question is, by what means can this be effected ? The whole mystery is explained in a single maxim. The first person ill



in a place is the only source from which all the rest, perhaps hundreds and thousands, become affected; let him be put immediately into a situation where he cannot injure, by contact, those who have not had the disorder. It is the duty of the individual and of the community; it is a duty owed to society and to the human race. We observe this duty when a maniac becomes dangerous to society, and shall we omit it here? where the danger is infinitely greater, and perhaps causes the death of thousands; and in the former, the separation lasts for years, or perhaps during life, whilst, in the latter, it is only necessary for a fortnight or three weeks; for the infectious period lasts only from the time of eruption to the complete falling off of the pustules. The principal means which M. Faust, therefore, points out, for the execution of this great plan, are,

1. That people of all conditions should first be instructed by sensible writings, that the small pox is not necessary, nor unavoidable — that its existence depends on our will, and that it is our duty to annihilate it.
2. A description of the disease, with good ideas thereof, should be circulated in all villages, in order that it may be immediately recognised.
3. Near each great town a moderately large house should be erected, for the small pox, and an inspector appointed.
4. All the inhabitants of towns and villages should contribute to its support.
5. As soon as any person is attacked with the disease, he should be immediately removed to a house of this description; perhaps ten in as many years would be all that are necessary to be brought in, and the parents and relations might be allowed to attend them.

Other regulations would be likewise proper, as publishing in the newspapers all the instances which occur; and when the patient leaves the house, he should leave his clothes behind him. Proper nurses and medical assistants should be appointed. Whoever chose to be inoculated, it should be done in this house. “How long,” exclaims M. Faust, “will men continue to carry, without reluctance, into society such a destructive pestilence?”

ence?" No persons should be admitted here but such as have gone through the disease; and, in general, none without permission of the medical officer superintending. All those that are admitted should avoid contact with the sick, and wash their hands and faces, and rinse their mouth on leaving the house; this should be observed equally by the medical assistants, nurses, and relatives. Twenty, or at most thirty, days after the eruption, when the pustules have fallen off, the convalescent, after bathing and changing his clothes, may be re-admitted in society.

If these rules are duly followed, continues M. Faust, it may with certainty be depended on, that in five or six years the small pox will no longer be found to exist in the civilized part of Europe, as far as the plague itself is extirpated.

Objections have however been started — 1. If they even were extirpated in some places, one might be infected by persons coming from other parts, or in travelling; consequently, the project ought to be universal; if useful, therefore, relying on the prevailing philanthropy and good understanding amongst mankind, it is to be hoped it would be adopted. Were there in Europe, in the darker ages, nineteen thousand houses of separation, for persons infected with the leprosy, of which number France alone contained two thousand; and shall not more be expected in our times against the small pox? And if even this should not be the case, the few that incur danger hereby are nothing in comparison to the thousands which would be preserved. The objection that has most weight against a partial extirpation of it is, that trade and commerce might be obstructed by it. Yet, in the infection of horned cattle, the communication of a large class of men equally suffers, and no one complains, on account of its utility and necessity. What is submitted to for the preservation of cattle, should we not hope would be submitted to for the preservation of mankind? Even quarantines obstruct the commerce between Turkey and the adjacent



cent states, yet they are submitted to with pleasure. It is sufficient that one country begin; and supposing this suffers for a time, it is certain that more, and, at length, all would follow so good an example. 2. It may appear hard to remove the sick from their families and friends; but they would be equally well nursed in this case, and the parents and relations might keep quarantine along with them. It is much more lamentable to consider ourselves as poisoning thousands, by remaining amongst those who have never passed through the disease.

3. It might be said, how would you act in large cities, where the disease had spread to a great extent? To this it is answered, that as soon as these houses are instituted, and the person first attacked removed, there would no longer be danger of its becoming epidemic. In large cities the small pox reigns incessantly, and may consequently remain a constant source for a whole country. Let these be divided into districts of six thousand inhabitants, and a house of separation for each; and, following the above rules, the disease will soon be at an end. Another objection to this plan is the expence which would be incurred. To this it is replied, that Germany would require two thousand eight hundred houses, the expence of which would be at most two thousand dollars. Here M. Faust is of opinion that insurance on lives might be connected with insurance from fire, which bears a proportion to property. He points out, by way of example, the county of Schaumburg Lippe, whose two towns, and the seventy-two villages it contains, are insured from fire for two hundred thousand rix dollars; if that county would annually pay two per cent. upon the value of insurance, the small pox houses necessary for it would be erected in four years, and a small contribution would only be requisite annually for their maintenance, and this only for ten years at most, the time the small pox would remain in Europe.

These are the objections which occurred to M. Faust himself; the following are the most important ones, which have been made in the public prints, especially in the *Med. Chirurg. Gazette of Saltzburg* — “ It might be prejudicial, to remove a man in the small pox to the small pox house in bad weather.” — Ans. As soon as these dispositions are carried into effect, the disease would be no longer epidemic, but sporadic, when it is generally of a favourable nature; patients so affected generally run about; and to such, removal could not be prejudicial. It is well known that free air is now very generally recommended, especially in the beginning of infection; and should even the disease have arisen to a great height, the house where the patient lay might be isolated on the same principles. At Chester this was done in private houses, and the existence of an epidemic prevented. In case the small pox makes its appearance in a slave-ship, from Guinea, the first person attacked is separated from the rest, and the extension of the disease put a stop to.\* This matter therefore is not so difficult as imagined. The beginnings of epidemics are gradual; one or two persons are at first seized, and from them the disease is propagated; if care be taken to remove those early, no epidemic takes place.

It has been asked, if the disease is even extirpated from a place, and a stranger enters, who is infected, who is to nurse him, as there is no longer any body that has gone through the disease? — As long as extirpation is not universal, persons will be found for this occupation; and if the establishment were general throughout Europe, the introduction might be prevented by cordons and quarantines, which at present destroy the contagion of the plague.

It has not been decided, it is also said, that the small pox is propagated by infection alone, for sometimes it rages as an epidemic; and at others it remains, even in its infection, sporadic; at times coughs, measles, and spurious small pox precede; and, at others, follow the small

\* Vide Haygarth's Plan for extirpating the Small Pox.



small pox ; and further, that the true may produce the spurious kind, or *vice versa* ; nor is it absolutely certain that the poison of small pox may not, in certain circumstances, be generated anew. All which proves, in the author's opinion, nothing more, than that at certain times a peculiar disposition prevails, in which infection makes a quicker progress than at other times. That measles, &c. may rage with and after the small pox is natural, but they have no dependence on each other. That the true and spurious kinds produce each other, is mere assertion, without example. Could the small pox generate itself, why did it not sooner appear in Kamtschatka, where the Russians carried it in this century ? Why do persons escape it till fourteen years of age or longer, in large towns, by separation merely, of which we have example in many princely persons ? Why is Rhode Island no longer infested with small pox, since the laws of separation have been observed ? But it is superfluous to attempt to prove a matter, which is received by the greatest physicians as decided.

Again, that the plague has not troubled us for half a century, appears to depend less, it is said, on our dispositions to prevent it, than on the nature of the malady itself — God forbid, says M. Faust, that this belief should become universal ! — It will hardly be believed by any medical man at present ! Can he be ignorant of the terrible plague of Moscow being occasioned by the war with the Turks ? Does he not know that in Smyrna and other towns in Turkey, when the plague rages universally, the Christian consuls escape it, by avoiding communication, and by locking up their houses, and purifying every thing admitted, by vinegar and other means ? It is singular that the plague should be found to rage only in Turkey and the adjacent Hungary, and yet that the reason of this should be sought in the unknown nature of the disease, when it is so perceptibly owing to the wise dispositions of enlightened magistrates.

Separation, it is likewise urged, would be of no avail, because it is impossible to cut off all means of imparting

ng the disease; for example, flies that feed on the matter, might carry it to remote parts. As ludicrous as this objection appears at first sight, it might be of some weight if confirmed by experiment, but here it fails. If flies and other insects could propagate it, it would not be possible to preserve one's self free in a place where the infection existed; of which however there are undeniable examples: much less could extirpation be effected in whole provinces.

Thus the objections apply not so much to the matter itself, as to the difficulty in the execution! and this is readily done away. Nothing is impossible to perseverance, led on by reason. Suffice it for us to know, that it is a sacred duty, and if attended with difficulties, should be persevered in with firmness. Rhode Island, St. Helena, and New England, are proofs of its practicability. Would to God that a speedy peace would lead the attention of mankind, and especially princes, to a consideration of a plan so preservative of the human species. Might not a coalition of all the powers of Europe be expected to be formed against so cruel an enemy to human life and human happiness!

Art. XVIII. *HYGROLOGIA CORPORA HUMANI, &c. The Chémico-physiological Doctrine of the Fluids contained in the human Body.* By J. J. Plenck, M. D. &c. &c. 8vo. 179 pages. Vienna, 1794. Boosey, London,

**C**HEMISTRY teaches us that the fluids constitute by far the largest part of the human body; and the consideration of them, with regard to their different offices in the animal œconomy, is a not less important part of physiology, than the doctrine of the solids themselves. The application of the new principles of chemistry to explain the composition of the animal fluids, has here, as in other cases, completely overthrown the opinions which were formerly entertained on this head; and has, we trust, reared a doctrine on a basis at once simple and certain. The subject is, however,  
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new, and hitherto, we believe, scarcely touched on. The great error of former physiologists principally consisted in this, that they did not sufficiently distinguish between the products of fire and putrefaction, and the simple and præexistent principles of the animal fluids. They were likewise ignorant of, or altogether neglected, the laws of vital affinity. It is to be lamented, however, that hitherto very few of the fluids of our own body have been examined on the principles of modern chemistry; yet there is reason to suppose that both physiology and pathology would receive considerable lights and improvements from their application. The present work of the learned and ingenious Professor, shews how far this science has yet been carried in the healthy state; and we are led to expect he will, at a future time, extend his inquiries to the morbid state, in a treatise of general pathology.

In an elementary treatise it is hardly possible to notice particularly every part. All we can do is, by extracting some portion, to give, as far as this can be done, a general idea of the whole. The Professor first treats of the elements of the human body; then of its constituent principles, consisting of solids and fluids; and lastly of each of the fluids separately, its nature and qualities: concluding with the putrefaction of the body, or resolution into its pristine elements.

The ultimate particles of an animal body, which we are unable, by chemistry, further to divide, are called its *elements*. Yet it is not improbable that these minute parts, which we at present consider as elements, will be discovered, by the industry of future times, to be themselves compounded.

The elementary principles of our body hitherto known, are 1. *Azot*, an element, which combined with hydrogen, constitutes *volatile alkali*; with the matter of heat, *azotic gas*; with carbon, the *gluten of animal fibres*.

*Azot* is the primary element of the animal body, for it may be procured from almost every part of the animal, by means of the nitrous acid, this having a  
greater

greater affinity with the elements than the azot itself. The mucus, jelly, membranes, tendons, ligaments, and cartilages, afford it in a less degree, by means of the nitrous acid. The lymph, serum of the blood, the water in dropsies, the liquor amnii, and cheese afford more. The greatest quantity is obtained from the coagulable lymph of the blood, and from muscle. The flesh of young animals contains less than the old; that of animals living on animal food, than on vegetable; and than the flesh of fishes. It is not probable that the azot is produced by the decomposition of the nitre; for after having performed the separation, it is capable of saturating the same quantity of salt of tatar as before.

2. *The matter of heat*, which enters into the composition of both solids and fluids, and which in a separate form constitutes the animal heat.

3. *The matter of light*, which in its free state produces vision; and when compounded, enters as an element into the composition of the fat and other inflammable parts. The eyes of animals, which shine in the night time, owe this property to the matter of light.

4. *The electric matter or fluid*, which enters into all bodies, and affords the phenomena of animal electricity.

5. *Oxygen*, which, with the matter of heat, forms *vital air*; with hydrogen forms water; with acescent bases the acid salts of our fluids.

6. *Hydrogen*, which, with oxygen, forms water; with azot *volatili alkali*; with the matter of heat, *inflammable gas*; which is emitted from the large intestines; and with carbon, animal gas: which, lastly, combined with carbon and the sebatic acid constitutes the oil of the adipose membrane.

7. *Carbon*, which, with hydrogen and the sebatic acid, forms *the oil of the adipose membrane*; with hydrogen alone, *animal gas*; with azot, *animal gluten*.

8. *Sulphur*, which combined with inflammable gas, constitutes *hepatic air*; which is exhaled from muscular fibres, hair, incubated eggs, animal gluten; and, according to Lavoisier, human excrement.

9. *Phos-*



9. *Phosphorus*, which, with oxygen, forms *phosphoric acid*; and with inflammable gas, *phosphoric gas*. The luminous sweat of some persons, the light given out by the putrifying carcases of some animals, and the phosphorus prepared from cheese and human bones, sufficiently shew, that phosphorus constitutes one of the elements of the body.

10. *Soda*, or the fixed mineral alkali.

11. *Potash*, or the fixed vegetable alkali. Each of these is found in several of the fluids.

12. *The earthy element*, no kind of which is so frequently found as the *calcareous*, in the bones and other parts.

13. *The metallic element*. Of all the metallic bodies, iron and manganese alone are found in an organized body, whether animal or vegetable. Iron is found in greater quantity in the flesh than in the bones; but in the greatest proportion in the red part of the blood.

14. *The odorous principle*, which is perceptible in all the animal fluids; but of a peculiar kind in the urine and fæces.

15. *The nervous fluid*, contained in the nerves, and which appears to be an element *sui generis*; differing from all other fluids, and not to be collected by art.

16. *The vital principle*. In all the solid and fluid parts of a living body, an element *sui generis* is present, which constitutes their life; hence it is not improperly termed *vital*. This principle induces a mode of union in the other elements, widely differing from that which arises from the common laws of chemical affinity. By the aid of this principle, nature produces the animal fluids, as blood, bile, the male semen, &c. which cannot be effected by the art of chemistry.

But if, in consequence of death, the laws of *vital attraction* or *affinity* cease to operate, then the elements, recovering their former properties, become again subject to the common laws of *chemical attraction*, and go into new combinations, from which are produced new principles; in a word, the *products of putrefaction*. Thus  
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the hydrogen, combining itself with the azot, forms *volatile alkali*; and the carbonated hydrogen with azot, forms putrid air or gas, into which the whole carcase is converted.

It appears from hence, likewise, why organized bodies alone, to wit, animal and vegetable bodies, are subject to putrefaction; to which inorganic or mineral bodies are, in no degree, liable. For the latter are not compounded according to the laws of vital affinity, but according to those of chemical affinity only. The resolution of the pyrites or ferrum sulphuratum on exposure to the air, is not putrefaction, but the oxygen, furnished by the air, combining with the sulphur, forms sulphuric acid.

Heat, as well as putrefaction, separates the constituent principles of animal bodies into their elements; but these, by a peculiar law, under the action of fire, again combine in a different manner, and form the *products of fire*. Thus the hydrogen, combined with azot, forms *volatile alkali*; and the hydrogen, combined with a large proportion of carbon, is changed into *empyreumatic oil*.

From what has been said, it appears, that the constituent principles of an animal body cannot be detected, either by putrefaction or the action of fire; but the elements of those principles may, by these means, be discovered. Thus, whenever the volatile alkali is found to be generated, azot and hydrogen may be supposed to have been present in the natural state of the animal substance; and when empyreumatic oil is obtained, we may conclude it to be furnished by the hydrogen and carbon of the part.

On a similar plan the learned Professor examines the constituent qualities of each part of the body, solid and fluid; concluding with an account of the nature of putrefaction, or resolution into its first principles.

*Putrefaction*, he defines, a fermentation of the dead body, by which it is decomposed, and dissipated in the air, in form of putrid gas.

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The requisites to the putrid fermentation are — 1. A certain degree of *humidity*. Thus bodies putrify sooner immersed in water; more slowly when buried in very dry earth, which absorbs the moisture from the body. 2. *The access of atmospheric air*. Thus bodies putrify sooner, when fully exposed, than when buried. In like manner, bodies putrify very slowly in the exhausted receiver of an air pump. Animals putrify quickest in vital air; slower in carbonic; but in nitrous gas the most slowly. 3. *A degree of heat of at least 10* by the scale. Thus bodies putrify sooner in summer than in winter. But if the heat be considerable, and suddenly applied, then the body is dried to a state of mummy. If the cold be intense, bodies may be preserved free from putrefaction for many months.

The fluids of the body are first dissipated in the air; then the soft parts; and, at length, the substance of the bones themselves, volatilized by putrefaction, totally evaporate. For coffins have been found, which had been deposited for ages, and accurately closed, in which not the least appearance of a body could be detected.

The dead body, therefore, does not resolve itself into earth, to be mixed with the dust, but into air, from which it was made. For the soil of burying places, in which, for ages, an immense quantity of carcases have putrified, is not at all elevated; and, were it otherwise, the whole surface of the earth would, by this time, from the accumulated bodies of men and animals, have become a mass of animal earth, which is no where found to be the case. Nor are dead bodies, when deposited in the earth, the food of worms. For these are found only in bodies exposed to the atmosphere, or at least which are superficially buried.

The phenomena of a putrifying body, are — 1. *Emphysematous enlargement*, whence arises the disposition, in drowned bodies to swim, after a time, on the surface. This enlargement proceeds from the conversion of the putrifying fluids into the gaseous state.

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2. *A cadaverous odour* is exhaled of a peculiar nauseous quality.

3. *The whole surface of the body* acquires a yellow tinge, interspersed here and there with greenish, livid, and black spots, which by degrees burst, and emit an intolerable putrid foetor, destructive to man.

4. *The swelling*, after a time, *subsides*, and the ruptured spots discharge a cadaverous *sanies*, by which the whole body is changed into a brown or greenish pultaceous mass; the cadaverous stench is again emitted, though weaker.

5. This putrid mass at length dries into a brownish, black, friable substance. This change is effected, for the most part, in eighteen months, and at longest within three years.

6. Of all the parts of the body *the bones* resist decomposition the longest, on account of their earthy compages, but at length they give way. Augustus, when he visited the tomb of Alexander the Great, found the body, to appearance, in the most perfect state of preservation; on the slightest touch, however, the unconquered hero, the former Alexander, crumbled into dust.

The deeper an animal body is buried in the earth, the more slowly it putrifies; more speedily in a calcareous than in an argillaceous soil, and most quickly in a moist sandy soil. If the sandy soil be very dry and friable, defended from the air and moisture, the gases constantly emitted are absorbed by the sand, and the body, in this state, is converted into a mummy. The bodies of women are more readily convertible into the state of mummy, than those of males, on account of their greater subtilty. Out of fifty-two bodies, dug up in this state from a cemetery at Paris, one only was a male.

Sometimes, though rarely, the soft parts are changed into a *saponaceous* substance, soluble in water; which, chemically examined, consists of a peculiar oil and volatile alkali. This change takes place when a number of bodies are so buried together, without any intermediate



diate earth, that the gaseous fluids, which are emitted, are not suffered to escape. In this case, one portion of the hydrogen combines with carbon, and forms oil; the other portion with azot, is changed into volatile alkali, producing, when mixed, a saponaceous mass, as was observed in the burying-ground at Paris.

The gases which escape from bodies, putrifying in the open air, consist, first, of *alkaline air or gas*, which is produced from the azot and hydrogen, afforded by the soft parts, and then impregnated with fixed air. Hence it is, that the putrid sanies of a carcase effervesces with acids, and changes the syrup of violets to a green colour.

2. *Of carbonated, inflammable gas*, which arises from the oil and decomposed animal gluten.

3. *Of phosphorated, inflammable gas*, whence the *ignes fatui*, observable about burying grounds; and the luminous appearance and fishy odour of some bodies.

4. *Of fixed or carbonated air*, which is produced by the union of oxygen, and carbon; and which afterwards, part, ærates the volatile alkali.

5. *Of azotic gas*, which is extricated from the animal gluten of the soft parts. From this arises the greenish tinge of the parts.

6. *Of putrid gas*, which seems to be generated from the chemical union of the carbonated inflammable gas with the azotic. This miasma is deleterious, by inducing putrid fever; and is that which generates that specific odour, which we call cadaverous.

The proximate cause of putrefaction is the cessation of the action of the vital principle; hence the laws of *vital affinity* cease to operate, and those of *chemical attraction* take place, which give rise to the *products of putrefaction* before mentioned.

Life may be defined the property of acting from an intrinsic power; hence the life of an animal body appears to be threefold — 1. Its *chemical* life, which consists in that attraction of the elements, by which the vital principle, diffused through the solids and fluids, defends

defends all the parts of the body from putrefaction. In this sense it may be said, that every atom of our body lives *chemically*, and that life is destroyed by putrefaction alone.

2. *Physical life*, which consists in the irritability of animal parts. This physical property remains for some time after death. Thus the heart or intestines, removed from the body whilst still warm, contract themselves on the application of a stimulus. In like manner, the serpent or eel, being cut in pieces, each part moves and palpitates long afterwards. Hence these parts may be said to live *physically*, as long as they continue warm and soft.

3. *Physiological life* consists in the action of organic parts, proper to each, as the action of the heart and vessels; so that, these actions ceasing, the body is said to be *physiologically* dead. This latter first ceases, next the physical life, and finally the chemical perishes.

*Use of the putrefaction of the bodies.* The soil of our earth, by absorbing the products of putrefaction, becomes black, and abounding in fertility; and hence becomes the principal food of plants. It is evident, therefore, that the body of man, by death and putrefaction, does not perish, but only loses its organic structure, by a continual circulation of the elements, the destruction of one becoming the generating cause of another.

The extracts which we have made above will serve to point out sufficiently the nature and execution of the work. The analysis it affords of the composition of the animal machine, conducted on principles which have not hitherto been applied to this subject, but whose simplicity and easy application strongly recommend them to the reader's attention, cannot fail to facilitate the acquirement of physiological science. We anticipate the pleasure we shall receive from the promised publication of the very respectable author, on the subject of General Pathology.



Art. XIX. *Experiments and Observations on the constituent Parts of the Potatoe-Root.* By George Pearson. M. D. F. R. S. 4to. 10 pages. Nicol, 1795.

**A**T a time of such general scarcity as the present, no object can well be considered more interesting, than an inquiry into the properties of such substances as promise to afford a substitute for wheat and other grain. The attention so laudably shewn to the subject by the Board of Agriculture has called forth the abilities of experimental philosophers, which doubtless will be productive of universal benefit. Dr. Pearson having been requested by the Board to enquire into the composition or parts of which the potatoe-root consists; and particularly to ascertain the proportion and nature of the watery part; the present publication contains the result of those inquiries.

Three thousand five hundred grains of potatoe-roots cut into slices of about one eighth to one twelfth of an inch in thickness, after exposure in a large glass dish to the heat of the steam of a water bath, of 190 to 200 degrees of Fahrenheit's thermometer, afforded 1000 grains of a hard, brittle, heavy substance, some of which were blackish from being a little burnt. The whitest and unburnt slices being ground to powder, afforded a greyish meal or farina, of the taste of raw potatoe-root, of about the same specific gravity, and drier than meal of wheat in its usual state.

Three pounds and half an ounce, Troy weight, of sliced potatoe-roots, afforded by distillation in B. M. about 27 ounces of fluid, measuring near 1 pint and 10 ounces. The distilled liquid was clear and colourless as rock water; it had the smell of the potatoe-root, and also a slight empyreumata smell; it had no taste; it did not alter the colour of paper stained with turnsol, nor that with turmeric; and left little or no residuum on evaporation to dryness.

A quantity of potatoe-roots was rasped; and in this state they resembled curdy matter in watery liquid. Of

these rasped potatoes 7000 grains were mixed with four pints of river-water. After being macerated twenty-four hours, during which time the mixture was frequently stirred, a clear dark brown liquid, of the smell of potatoe-root, possessing neither acid nor alkaline properties, was poured off, leaving behind a large proportion of leafy or fibrous substance, and a precipitate of white impalpable powder. This white precipitate and fibrous substance was macerated repeatedly with fresh portions of water till the decanted liquor was colourless, and without smell or taste. The fibrous substance and white precipitate being mixed with water, were poured upon a fine hair-sieve, through which the water passed, carrying with it the white precipitate and the fibrous matter was left behind. The white sediment deposited from the filtrated water, on standing, being collected and dried, weighed one thousand and fifty grains. — It had the obvious or sensible properties of starch of wheat, and afforded a transparent jelly with boiling water. The leafy and fibrous substance being dried, was small, hard, brittle irregular figured masses, which amounted in weight to 600 grains. A pint of the first filtrated brown liquid, poured off from the leafy substance and white precipitate, being evaporated, an extract was obtained, which had a strong smell of potatoes, and from empyreuma. It had a slight saltish taste; but to the tests of turnsol and turmeric, betrayed no acid or alkaline properties. The whole extract or soluble mucilage in 7000 grains of potatoe-root, by estimation, was from 350 to 400 grains. In course, the quantity of water in their quantity of potatoe-root, was about 5000 grains.

A little of the dried *leafy substance*, obtained in the last experiment, and also a little of the *extract* on burning, emitted the smell of farinaceous substances, and not at all that of animal matter in general, or of glue of wheat in particular.

A bit of paper, stained blue by turnsol, being applied to a slice of potatoe-root, was instantly turned to a red colour.

Some



Some other experiments are related, which serve only to shew, that this affords, on decomposition by fire, the same results with other vegetable matter. Having stated what are the kinds and proportion of the different substances, Dr. Pearson speaks of the composition generally. ' The composition, or more properly the mixture of the potatoe-root is, in many respects, similar to that of the seed of wheat and of maize. We are indebted to James Bartholomew Beccari, professor of chemistry at Bologna, about seventy years ago, for the important discovery that the meal of wheat and maize contained not only starch, but a soluble mucilage or extract, and a glue of the same nature as animal matter. These three substances are only mechanically mixed with one another. The glue is not capable of the saccharine, vinous, or acid fermentation; but, like animal matter, putrifies. It also affords ammoniac or volatile alkali on distillation; and on burning emits the peculiar smell, and gives the other products of animal substances. Neither does it afford pot-ash like vegetable substances. Beccari, in his account of it, says, "*Massa mollis, supra quam credi potest tenax: egregium glutinis genus, et ad opificia multa aptissimum.*" The principal and essential difference between the meal of wheat and of potatoes is, that the former contains animal matter, and the latter, in place of it a leafy or fibrous vegetable matter; but the principal ingredient in point of quantity in both kinds of meals, is starch; and they both afford an extract, or contain a soluble mucilage. The proportion of the animal glue of wheat is stated variously in different experiments; but the general mean result appears to be, that it is about one-twelfth of the meal. To this glue is imputed the superior quality of wheat-meal for bread. It is supposed to give tenacity and firmness, and at the same time promotes the fermentation in making bread, as well as gives it a taste.

It appears on the whole, therefore, that potatoe-roots afford about five-sevenths of their weight, or 28 to 30 per cent. of meal. Hence, if a bushel weigh 75 pounds, it should yield 21 or 22 pounds of meal. The meal

consists of three different substances. 1. Starch or *fæcula*, 17 to 15 parts in 100 of the raw root; 2. Leafy or fibrous matter, 9 to 8 parts; and extract, or soluble mucilage, 6 to 5 parts. And Dr. Pearson thinks that we may safely conclude that 98 or 99 parts out of 100 of the meal of the potatoe-root are capable of being assimilated into animal matter.

He is of opinion that there is not sufficient ground for the common supposition, that the meal of wheat must afford much more nourishment than an equal quantity of potatoe or other meal; for though this has been accounted for, from wheat containing an animal glue, which the others do not, it is reasonable to conclude that this is in too small a proportion to occasion any considerable difference in their nutritive properties. It is, he observes, a fact, and one of great importance, that potatoes and water alone, with common salt, can nourish men completely; but other mealy substances, although the principal food of millions of the human race, who never taste animal substances, always are mixed with other kinds of alimentary matter; such as oil, fruits, whey, or milk.

To prepare potatoe-meal of the best quality, the sliced roots should be dried in a much lower temperature than in the above experiment; and the author thinks this best done by suspending them in nets in the air of a kiln, of the temperature of about 110 to 130 degrees. He objects to rasping the roots, and draining off the liquid, as the meal, by that means, would be deprived of the soluble mucilage, which is probably nutritive, and may improve the other parts.

Dr. Pearson thinks that potatoe-meal may be used for preparing the different sorts of starch, distinguished by the names of sago, tapioca, vermicelli, maccaroni, salep, and common starch. The art of fermenting potatoe-meal into bread by itself has not yet been discovered; but it may be used in the proportion of one part to two or three of wheat. The potatoe-root may be rendered more nutritive by malting; but the stronger flavour it would acquire by this operation, would render it, probably, less useful as a general article of food.



Art. XX. *Medical Reports of the Effects of Blood-letting, Sudorifics, and Blistering, in the Cure of the acute and chronic Rheumatism.* By Thomas Fowler, M. D. of York. 8vo. 287 pages, price 5s. boards. Johnson. London. 1795.

**D**R. FOWLER will readily be recognised as the author of Reports on the effects of tobacco and arsenic, in the cure of dropries and agues, published several years since, and which met with a very favourable, and we may add well merited, reception from the faculty. Experience has borne testimony to the accuracy of his representations, and confirmed the truth of his facts. In giving therefore another volume of his observations to the public, he has made them a welcome present, and which we doubt not will be productive of equal utility with those formerly published. The work is almost wholly of a practical nature; the proximate cause of the disease, the *ratio symptomatum*, and other matters of a theoretic nature he has scarcely touched on. It consists of a great variety of cases drawn up apparently with every degree of accuracy and fidelity, interspersed with general observations, the result of well ascertained facts. One hundred and twenty two cases of rheumatism are here brought forward, which had occurred to the author, as physician to the General Infirmary at Stafford, and in his private practice. They are arranged under different heads, according to the method of treatment adopted. The means made use of for the cure were, 1. Blood-letting.—2. The tincture of guaiacum.—3. Dover's powder.—4. Warm bathing.—5. Blistering-plasters — and lastly, The turpentine embrocation. Instead of detailing cases, which are by far too numerous to admit of many of them being given, we shall present our readers with the general result, and observations of the author on each plan which he employed.

1. *Blood-letting.* If after the first operation of blood-letting, any particular part of the body should become

more distressingly painful than the rest, it will in general, Dr. Fowler observes, be more eligible to apply leeches to the part affected, as a local evacuant, than to repeat the operation with the lancet.

The obvious useful effects of general blood-letting in the acute rheumatism are, a speedy abatement of the rheumatic pains, and a mitigation of the feverish symptoms.

The application of leeches, or cupping glasses, will generally procure an immediate relief of the parts pained, as a local remedy; and at the same time some diminution of the morbid action of the system. Their prudent application, therefore, may often successfully supersede the farther use of the lancet, after the first operation with that instrument.

Of eighty-seven cases of acute rheumatism, the lancet was employed in forty-one, and the effects, carefully collected from a tabular view of the cases arranged for the purpose, appeared in the following order:

Three cases were cured chiefly by it, seven were much relieved, seven moderately relieved, twenty but little relieved, and four received no benefit.

Of thirty-seven chronic cases, in which the lancet was employed, one was cured chiefly by it, two much relieved, five moderately relieved, twenty-one but little relieved, and eight not relieved.

2. *Tincture of guaiacum.* The medium dose of the tincture of guaiacum, which was administered, with the sudorific regimen, to adults, was half an ounce, in about three ounces of water at bed-time. The dose was now and then enlarged to five or six drams; but was much oftener diminished to three drams, especially to women.

In like manner, three drams to a youth of fifteen years old, and two to a boy of ten, have generally been exhibited as the medium sudorific doses for their respective ages; and with operative and curative effects similar to those in adults.

The sudorific doses were administered for the most part every other night; at other times for three or  
four



four nights successively; and sometimes night and morning every other day.

The assistance of a sudorific regimen, or the drinking of warm diluting liquors in bed, is highly useful in promoting the operation of any sudorific medicine. The tincture of guaiacum was generally administered early in the evening; that the patient might have the advantage of being supplied regularly by his attendants with a tea-cupful of warm balm, or other herb tea, or small white wine whey, every half hour, for two or three hours together.

Sometimes the medicine was exhibited in the morning, some hours before the usual time of rising: and from the natural disposition of the body to perspire more readily at that time than in the evening, some patients will be made to sweat more successfully by morning doses, than by evening ones.

During the intervals between the sudorific operations, the tincture was frequently given in doses of one dram morning and afternoon every day, by way of promoting insensible perspiration; in which dose it will often prove gently laxative likewise, and sometimes procure, though slowly, further relief of pains.

The tincture in general agrees extremely well with the stomach; but always occasions a smarting heat in the mouth and throat immediately after being taken. This effect, however, may be speedily obviated, by the patient's swallowing a mouthful or two of water after it.

The tincture was administered to sixty-nine patients afflicted with the acute rheumatism, who made reports of its effects; and to one hundred and eleven of those afflicted with the chronic rheumatism, whose cases occurred in a given time, and who likewise made reports of its effects. Of these one hundred and eighty cases it proved sudorific in one hundred and fifty-three; of which number it was copiously so in one hundred and eight, but moderately so in forty-five, and not at all in the remaining twenty-seven.

The

The medicine appeared to be rather more frequently sudorific in acute cases, than in chronic ones ; otherwise its operations were nearly alike in degree. The tincture had some effect upon the intestines in ninety-two of the one hundred and eighty cases : of which number it proved purgative in twenty-three cases, moderately laxative in fifty-seven, and but just perceptibly so in twelve. In the remaining eighty-eight cases, it was not at all laxative. It proved rather more operative on the intestines, both in degree and frequency, in acute cases, than in chronic ones.

It deserves notice likewise, that, although the tincture was almost always sudorific, yet sometimes it proved laxative when it did not prove sudorific ; and it appears by the tables, that there were only fifteen cases out of the one hundred and eighty, in which it did not prove either sudorific or laxative, or both.

It was observable, that in those cases, in which it did not prove more or less sudorific, it generally somewhat heated the patient, and made him restless.

Occasionally it has made the patient sick, and has been thrown up. This accident has generally happened when it has been taken either in too large or too small a quantity of the vehicle, which should not be less than two ounces and a half, or more than three ounces and a half, to half an ounce of the tincture. These are the only operative effects I have met with deserving notice.

Of the sixty-nine acute cases in which the tincture was administered, there were thirteen cured by it alone : twenty-one cured chiefly by it ; fourteen much relieved ; six moderately relieved ; nine but slightly relieved, and six not relieved.

Of the one hundred and eleven chronic cases, in which the same medicine was exhibited, sixteen were cured by it alone, and seventeen chiefly by it ; twenty-two were relieved by it, thirteen moderately, and twenty-three but little ; and twenty experienced no benefit from its use.



3. *Dover's powder.* The medium dose of the Dover's powder, administered to adults as a sudorific, was one scruple, which was generally taken in bed at an early hour, and in the same manner, and with the same regimen, as the tincture of guaiacum. But it was no unfrequent direction, to order the patient to take ten grains of the powder every hour, for three times, unless the first or second dose proved sudorific; which if it did, the remainder was not to be taken. When this method was pursued, it generally happened that two doses proved sufficient.

Fifteen grains of the powder were usually exhibited, as the medium dose, to a youth of fifteen years old, and ten grains to a boy of ten years old.

The sudorific doses were sometimes administered for several nights together; but more commonly every other night.

The Dover's powder was administered to eight-five acute and chronic rheumatic patients, who made reports of its effects. Of this number it caused forty-four to sweat copiously, twenty-one but moderately or slightly, and to twenty it was not at all sudorific. — Whence it appears, that, although in a given number of cases the sudorific operations were less frequent from the Dover's powder, than from the tincture of guaiacum, yet when the sudorific discharge had once taken place, it was in general full as copious from the former as from the latter.

With respect to the difference of the sudorific operation of the powder in rheumatic cases, it was evidently both more frequently and more copiously sudorific in acute cases, than in chronic ones.

It was likewise found to possess an anodyne quality, by which it often mitigated rheumatic pains like a charm, and frequently thereby procured sleep.

By its astringent effect, it commonly obviated a laxative and irritable state of the bowels. In many cases, therefore, attended with these troublesome circumstances, it was found a preferable medicine to the tincture of guaiacum.

In a few cases, however, its operative effects were somewhat troublesome, producing a nausea, or vomiting, a slight vertigo, or a transient confusion of ideas: but these effects were extremely rare, and may be easily obviated by diminishing the dose of the powder.

Of thirty-one acute cases treated with the Dover's powder, thirteen were cured chiefly by it, eleven relieved, and seven not relieved.

The curative effects of the Dover's powder, although considerable, appear upon a careful comparison somewhat inferior to those of the tincture of guaiacum, in a given number of cases; a principal cause of which probably arises from its not operating as a sudorific so frequently, as the tincture.

Of fifty-four chronic cases, in which the Dover's powder was given, three were cured by it alone, and four chiefly by it; four were much relieved by it, eleven moderately, and fourteen but little; and eighteen received no benefit from its use.

4. *Warm bathing.* Warm bathing was found to be a very efficacious sudorific remedy for the removal of pains in some of the most obstinate cases of chronic rheumatism. The patients generally staid in the bath, made as warm as they could bear it, about fifteen or twenty minutes, more or less, according to their feelings, or till an incipient faintness and sickness warned them to remove from their situation. Immediately after, being put into a warm bed, they were treated with the usual sudorific regimen; which was almost always attended with a very copious discharge of sweat, and that for several hours, or the greater part of the night, with proportionable relief of the pains. Nevertheless, its operation being so considerable, it was found to weaken the patient much more than either the tincture of guaiacum or the Dover's powder. On which account it was never administered without a strict attention to its effects.

In thirty-eight cases of chronic rheumatism, wherein warm bathing was applied, twenty-nine patients  
made



made use of a bath of warm water, in these Reports commonly called the warm bath, and nine of the vapour bath; and the sudorific operation proved copious in thirty-six of these patients, and only somewhat deficient in the remaining two. The time they staid in each of these baths, and their operative and curative effects, were so much the same, that there is only one remark to make respecting them, namely, that as the vapour bath cannot be employed without the use of a complex machine, prepared for that purpose, and consequently seldom to be met with, except in some large towns, the warm water bath may very well supply its place, and will be found perfectly sufficient for every purpose of simple warm bathing: and accordingly the latter term has frequently been employed in these Reports, without specifying which kind of bath had been prescribed.

Of the preceding thirty-eight cases of chronic rheumatism, treated with warm bathing, thirty of them were of the genuine chronic kind; of which number four were cured chiefly by it, eight much relieved, ten moderately relieved, and two not relieved. And if it be considered, that the majority of the cases were the most obstinate that usually come into an hospital, it is presumed that the success will not appear inconsiderable.

5. *Blistering plaisters.* The curative effects of blistering plaisters in relieving violent chronic pains are in general very striking, and merit considerable attention. It must be acknowledged, however, that as local remedies, when we consider the short and more transient nature of the pains in the acute than in the chronic rheumatism, their curative influence was less conspicuous in the former than in the latter.

In twenty-two cases of acute rheumatism, wherein blistering plaisters were applied, the urgent pains of two patients were totally removed, in eleven they were much relieved, in six but moderately or slightly so, and in three not relieved.

Of fifty-nine chronic cases, in which they were likewise employed, and the patients had made reports of their effects, the pains were intirely removed in fifteen, much relieved in twenty-one, moderately relieved in six, but little relieved in seven, and not at all relieved in the remaining ten.

It was likewise found in the treatment of the chronic rheumatism, that blistering was one of the most powerful means with which we are acquainted, for the effectual removal of those deep seated and fixed pains commonly called lumbago and sciatica.

6. *Turpentine embrocation.* The relief of chronic rheumatic pains was often attempted by local applications, such as the turpentine embrocation, the camphorated spirit of wine, soap liniment, Bates's anodyne balsam, camphorated oil, and the volatile liniment, all of which were occasionally of use as palliatives, but the first more frequently than any of the rest. Of twenty-six cases of chronic rheumatism, collected in a given time, in which the turpentine embrocation was employed, three were much relieved, six moderately relieved, fifteen a little relieved; and two not relieved; and therefore from its curative effects, though only partial, it is entitled to some attention as a palliative remedy.

The author afterwards gives, what he calls a sketch of the history of the acute rheumatism, with observations, subservient to the history of the chronic rheumatism. This will be found not to differ materially from the history, (except in being more full) of the disease, as given by Dr. Cullen and other practical writers. The distinguishing symptoms of the acute rheumatism are pointed out as follows:

The acute rheumatism is attended with feverish symptoms. The natural functions are chiefly affected. Transition, recurrence, and exacerbation of pains are pretty frequent. The patients are more frequently affected from the age of ten to thirty. The acute more frequently attacks females: the chronic, males. The acute occurs most frequently in January, February, and



and March. It is more frequently and more speedily cured or relieved by art. It is sometimes dangerous. The pains, except that they are more frequent in the loins than in any other part, are more general in the system; more frequent in the upper limbs than in the lower; and most frequently affect the arms and hands. In the acute, the pains are generally worse in bed; but in the chronic frequently easier. The acute most frequently affects strong and sanguine habits; the chronic, the infirm and phlegmatic. There is an increased sensibility of the parts affected, which are extremely painful on pressure. In the acute, the efforts of nature towards a natural cure are often obvious; and it often degenerates into the chronic, the converse of which scarcely ever happens.

After some general observations on the treatment of each species, he concludes with the following practical inferences. — 1. That there are very few cases of the acute rheumatism, that will not admit of an artificial cure, especially by the sudorific plan of treatment.

2. That there are likewise scarce any cases of chronic rheumatism, that will not admit of some material relief; and that near one-half of a given number will admit of an artificial cure, especially by the sudorific plan of treatment.

3. That if the acute rheumatism be in the second or third week's stage of the disease, an artificial cure will be more frequently obtained during the first week's treatment, than when it occurs at any other period.

4. That if the acute rheumatism be in the first week's stage, an artificial cure will often be obtained during the first week's treatment; but it will rather more frequently, especially if strongly marked by general pains and considerable febrile symptoms, resist the curative influence of medicines until the second week's treatment, and sometimes even longer.

5. That the moderate use of the lancet, especially as a preliminary to the administration of sudorifics, is a valuable auxiliary in the treatment of the acute rheumatism.

matism ; but it will seldom be of any material service in the treatment of the chronic rheumatism.

6. That the tincture of guaiacum is almost always sudorific, and frequently laxative ; and is extremely efficacious in the treatment of both the acute and chronic rheumatism, especially the former.

7. That the Dover's powder operates for the most part as a powerful sudorific, and also as an anodyne and astringent, and is a very efficacious remedy in the treatment of both the acute and chronic rheumatism.

8. That the warm bath is most powerfully sudorific, and a very efficacious remedy in the treatment of the chronic rheumatism ; but it is more debilitating in its operation than either the tincture of guaiacum, or the Dover's powder.

9. That the application of leeches is extremely useful as a local remedy, for the mitigation of the more urgent pains of particular parts, in the treatment of the acute rheumatism.

10. That the application of blistering plaisters is generally attended with a vesication, a smarting soreness, and a copious discharge ; and is one of the most efficacious local remedies experience has yet discovered, for the relief or removal of fixed rheumatic pains, especially those of the sciatica and lumbago.

11. That the turpentine embrocation is an useful palliative remedy for the purpose of relieving troublesome pains not deeply seated in the treatment of the chronic rheumatism.

Art. XXI. *Practical Observations on the Cure of hectic and slow Fevers, and the pulmonary Consumption: To which is added, a Method of treating several Kinds of internal Hæmorrhages.* By Moses Griffiths, M. D. A new edition, 8vo. 50 pages, price 2s. Callow, London, 1795.

THE observations of the late Dr. Moses Griffiths, having at the time of their first appearance been held in estimation, and having been now long out of print,



print, it was thought a republication of them would be well received. They now appear, without alteration or addition, in their original form.

In the hectic fever, not attended with any great degree of heat or thirst, and which does not shew manifest signs of inflammation, the author long used the following medicine :

‘ R. *Myrrhæ drachmam unam ; solve terendo in mortario cum aquæ alexiteriæ simplicis unciis sex cum semisse ; aquæ cujuslibet spirituosæ drachmis sex, vel uncia una ; dein adde salis absinthii drachmam dimidiam, salis martis grana duodecim, syrupi simplicis drachmas duas. Fiat mistura, in haustus quatuor distribuenda, quorum unum capiat mane, horâ quintâ post meridiem, & horâ decubitûs.*

On this medicine the author makes the following observations. — ‘ This proportion of the simple and spirituous water will, with care, dissolve the myrrh entirely, which is a circumstance that should be attended to ; since, by that means, the medicine will sit lighter on the stomach, and probably pass more readily into the blood. I have, indeed, lately found, that the solution may be made without any spirituous water, if at any time it should be thought too heating ; though I am in doubt, whether it will agree so well with the stomach of patients in general. ;

‘ The myrrh may gradually be increased to seventeen or eighteen grains for a dose ; the salt of wormwood to ten, and the salt of steel to four. But it is always best to begin with small doses ; and, as the symptoms abate, to give two draughts a day, each containing eighteen or twenty grains of myrrh, twelve of salt of wormwood, and five or six of salt of steel, which is the largest dose I have given. Although this medicine may, at first sight, appear to be nauseous, yet I have scarce ever found it rejected by the stomach, or exciting any kind of disturbance in the habit afterwards.

‘ I have used the same method, with equal success, in slow fevers, attended with a low pulse, not much heat, loss of appetite, dejection of spirits, restless nights, and  
disturbed

disturbed sleeps — Likewise, after long and severe fevers, that have broken down the constitution, and are often succeeded by lowness, want of appetite, and night sweats — In the slow fever, which often attends a *chlo-rosis* — Also, after the blood has been drained, and the body weakened, by a large discharge of matter from a succession of abscesses — After large hemorrhages, which leave behind them a slow fever — In intermittents, where either the bark has failed, or may have been improper to be given — And also, where the intermittent has been removed, and a slow lurking fever remains, attended with weakness, loss of appetite, dejection of spirits, and night sweats — In short, I may venture to say, in almost every case, where the bark may seem to be indicated, but where either its disagreeing with the stomach, or some particular circumstance, forbids its use.

• In intermittents, I have generally given it four times a day, with rather a less dose of myrrh, and a larger of salt of wormwood; and I have always ordered chamemel-flower tea to be drank with it, or between the doses.

• In the cure of the *diabetes*, I shall give two remarkable cases, where it succeeded, after most of the common methods had been tried without success.

• In the fever, which often accompanies that kind of madness which inclines to melancholy, and is attended with a restlessness and anxiety, I have reason to believe that this medicine will be of service, having seen an instance of this kind, where it gave much relief. — A woman, in this state, had not slept for a long time, and was very costive. I ordered her a purge, to empty the bowels; a large dose of opium at night; and afterwards, this medicine. In a week's time she was so much recovered as to give great hopes of a cure: but the cause of her madness remaining, and being poor, she was sent to St. Luke's Hospital. If those gentlemen of the profession, whose peculiar province it is to attend mad patients, would give this medicine



medicine a fair trial, I should hope that they would, in many cases, find it beneficial.

‘ It is sometimes doubtful, whether the fever is more of the inflammatory kind, or of the slow hectic. In that case, I generally began with this medicine ; and if it did not answer, gave that with nitre, &c. to be mentioned hereafter. If on the contrary, I had begun with the nitrous, and found it did not succeed, I then had recourse to the former. But I generally gave a gentle purge first, in order to cleanse the first passages, and prevent the medicine from running off by stool ; unless the patient was much weakened, and the bowels were in good order.

‘ In hot and costive habits, I gave a solution of manna and Glauber’s salt, with a little spirituous tincture of rhubarb. But in case of a lax habit, and tender bowels, a draught with a drachm, or a drachm and a half of *magnesia alba*, and three or four drachms of the above-mentioned tincture. If there were any sickness or load on the stomach, I found it proper to give an emetic of ipecacuanha, in a morning.

‘ In hektics, which are attended with a cough, and difficult expectoration, soft, oily, healing medicines, to be taken in small quantities, occasionally, will be very necessary. And if the cough is troublesome in the night, and prevents rest, forty, fifty, or sixty drops of paregoric elixir may be given at bed-time in a glass of water ; (though I have not often found occasion for it ;) but if that should make the expectoration more difficult, a draught with oxymel of squills, oil of sweet almonds, and a sufficient quantity of paregoric elixir, or the like, according to the discretion of the physician, will generally obviate that inconvenience.’

In proof of the truth of these remarks, several cases are brought forwards, one or two of which we shall select : — ‘ A young lady, at Hampstead, about eighteen years of age, after having recovered from a pleurisy, for which she had been several times bled, was seized with a burning hectic fever, attended with a

hard and dry cough, difficult expectoration, flushings in the face, a hot and dry skin, and a quick pulse. I ordered her draughts, with fifteen grains of myrrh, four grains of salt of steel, and from eight to ten grains of nitre, to be taken twice or three times a day, which, as she lived out of town, I left to the discretion of her apothecary ; so that, perhaps, she might take but two draughts a day ; at least, at first. She used besides, whenever she coughed or wanted to expectorate, a small quantity of an oily pectoral mixture, made agreeably acid. In about a week's time, I advised her to go into her native air, near sixty miles from town, and to drink asses milk with testaceous powders, continuing the use of the medicines, and, after a time, to take but two draughts a day, each containing a scruple of myrrh, ten grains of nitre, and five of salt of steel. On her journey into the country, she was taken very ill in the coach, when a tubercle or small abscess broke in her lungs, and she expectorated near a spoonful of matter, mixt with blood, which gave her immediate ease. She continued her journey ; and by the use of the medicines and asses milk, became perfectly well.

‘ I think it may reasonably be inferred from the history just related, that one lobe of the lungs had been so far inflamed, that matter was actually formed before she began the medicines ; and that the effect, which they produced, was, that by lessening the heat of the blood, and gently bracing the vessels at the same time, they prevented the formation of more matter.

‘ It may not be improper to add, that I advised this young lady (as I do in all such cases) to live, as much as she could, on milk, pudding, rice, milk pottage, potatoes, turnips, &c. with as little animal food as possible, and that of the lightest kind, and at dinner only ; and to abstain from all fermented liquors, except a very little red wine mixed with water, and a little juice of Seville orange or lemon, at dinner ; and when thirsty, a very weak tea of red rose leaves, acidulated with juice of lemon, and sweetened to the palate. To those  
who



who cannot get asses milk, or with whose stomach it does not agree, artificial asses milk, or cow's milk skimmed, will often prove very beneficial. I have likewise frequently seen very salutary effects from the use of snails, either boiled in new or skimmed milk, with water sufficient to answer the evaporation; or else swallowed raw.

‘ I attended another young lady, about ten years of age, in a true pulmonary consumption, who, after having been twice bled, was cured by the same medicines as the former, only with less doses, in proportion to her age.

‘ A young man, servant to a stage coach master, in Colchester, came to me with all the symptoms of a true pulmonary consumption, in a high degree, and was much reduced. I ordered blood to be taken, and gave him a gentle purgative; and then, the draughts with myrrh and nitre, as above; and an oily pectoral mixture, a little acidulated, to be taken occasionally in case of cough, or difficult expectoration.

‘ He became perfectly well, and continued so for some months; but having caught an accidental cold, he relapsed into his former malady.

‘ I ordered him the same medicines as before; but they purged him very much. Upon which, I prescribed for him a draught with *magnesia alba* and tincture of rhubarb, and then the following;

‘ R. *Nitri purificati scrupulos quatuor, salis absinthii scrupulos duos cum semisse, salis martis drachmam dimidiam, testarum ostreorum præparatarum drachmas duas, aquæ menthæ vulgaris simplicis uncias sex cum semisse, aquæ cinnamomi spirituosæ unciam cum semisse, syrupi simplicis unciam dimidiam. Misce.*

‘ Of this he took two large spoonfuls, three times a day, with an equal quantity of the white decoction; and having for some time continued this, and his pectoral mixture, he quite recovered.

The method of treatment in internal hæmorrhages, which the author recommends, is the giving *cold-drawn linseed oil*, with tincture of rhubarb, sufficient to keep

the body gently open. The principal cases, in which he had used it, were hæmorrhages of the stomach and intestines, and of the urinary passages.

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Art. XXII. *Medical Facts and Observations*, Vol. VI. 8vo. 233 pages, price 3s. 6d. Johnson, Lond. 1795.

THE present volume of Facts and Observations contains thirteen articles, several of which are however compiled from other works. The first contains observations on the use of arsenic in the intermittent fevers of a tropical climate; to which is prefixed an account of the weather at Sierra Leone, during the season in which such fevers are most prevalent. By Dr. T. M. Winterbottom, physician to the settlement at Sierra Leone.

In the months of October, November, and December, intermittents were so prevalent, that scarcely a family in the settlement, although the whole number was nearly four hundred, remained perfectly free from them. They generally observed the quotidian and tertian type; there were, however, a few instances of double tertians. Most of the above cases were so mild, particularly among the men, as not to prevent them from following their different occupations, except during the time of their paroxysms. But in some instances, the daily recurrence of the disease, the long continuance of the paroxysm, and poor diet, consisting chiefly of salted meats, rice, cassada, &c. reduced the patients to a state of great debility, and insensibly laid the foundation of long and tedious complaints. The greatest sufferers from intermittents were those who had previously laboured under remittent fevers, and had not yet recovered their strength; also persons of delicate and irritable habits, children, and women giving suck.

In every instance, where the bark was taken in due quantities, and persisted in for a proper length of time, the paroxysm was speedily checked, and the danger of a relapse effectually prevented; nor did the patient suffer those ill effects which usually occur where the disease

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ease has continued long, and been left to itself. Few, however, of the common people could be prevailed on to take the bark in any form; and even those who took enough of it to obviate the return of a single paroxysm, would seldom continue a sufficient length of time to eradicate the disease. These considerations, joined to an apprehension that serious and alarming consequences might ensue from frequent relapses, determined Dr. Winterbotham to try the effects of the mineral solution, according to the plan recommended by Dr. Fowler.\* Finding, after repeated trials, that no ill effects on the bowels were produced by its exhibition, he was encouraged to employ it generally. A considerable number of cases are detailed, in which this remedy proved successful. All the patients, whose cases are here related, continued to enjoy good health afterwards; and, after several months, none of them experienced the least unpleasant symptom which could be attributed to the remedy employed.

II. *An Account of the good Effects of a Solution of Sal Ammoniac in Vinegar, employed as a topical Application, in Cases of lacerated Wounds.* By Mr. H. Y. Carter, Surgeon at Ketley, in Shropshire. — In these cases, Mr. Carter found the use of this solution much preferable to emollient applications. The inflammation was sooner reduced, and union of parts more speedily effected than by the ordinary mode of treatment.

III. *Case of a diseased Kidney.* By the same — The relation of this case is as follows: “ A seaman, forty years old, of a plethoric habit, applied to me at Port Royal, in Jamaica, in 1782, with complaints nearly as follow — A constant aching, and sometimes acute pain, about the region of the right kidney, attended with a numbness of that side, and pricking pains along the urethra, particularly when he passed his urine; frequent inclination to make water, sometimes without ability to void any, and never voiding it but in small quantity; the urine itself being high coloured, depositing a gritty la-  
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\* Medical Reports of the Effects of Arsenic, in the Cure of Agues, &c. London, 1786.

teritious sediment, smelling very strong, and forming a film on its surface, which approached to a yellow colour. He complained likewise of a sense of fulness and heat at the neck of the bladder and about the perinæum, and could get but little rest in any other than an horizontal posture; he was costive, and had frequent nausea. As he had a full pulse, ten ounces of blood were taken from the arm, and a purging draught was administered; after which he took occasional doses of a mixture, the principal ingredients of which were diuretic salt and tincture of opium. In the course of two or three days his pain was much alleviated, but the difficulty with which he voided his urine still continued. He now complained of frequent and painful erections, more especially when an inclination to make water came on; he had likewise profuse colliquative sweats, and was costive. Care was taken to obviate this disposition to costiveness, by means of purgative medicines and clysters. Opium was now more liberally administered, and recourse was occasionally had to the warm bath. This last produced a certain degree of ease while he remained in it, but the sense of stricture about the neck of the bladder continued, and the quantity of urine he was able to void seemed every day to become less, so that at the end of a fortnight it was deemed necessary to make use of the catheter, as he was unable to pass a single drop of urine without it. By means of this instrument, from four to six ounces of turbid urine were drawn off twice a day. He had now much fever, and the pain about the neck of the bladder was become very acute, and seemed to affect him spasmodically, as well after as previously to the introduction of the catheter. He was likewise frequently seized with violent pain, which began in his shoulders, and proceeded along the right side to the hip. About a month after the first use of the catheter, he complained of a pain in the urethra, near the seat of the prostate gland, particularly when the instrument was passing; and at times the catheter seemed to meet with some resistance at that part. From this circumstance,

together



together with the continuance of the pain in that and the neighbouring parts, and the frequent discharge of drops of a mucous consistence from the urethra, we were inclined to think that the principal seat of the disease was in the prostate gland, (especially as no appearance of calculus had been observed,) when a fresh set of symptoms directed our attention more particularly to the right kidney. These symptoms consisted in a pain about the region of that kidney which he had before scarcely mentioned, but which now (about seven weeks after he first made his complaints known) was, at times, very severe. His shoulders also, but particularly the right, were sore, and at intervals acutely painful; the inguinal and axillary glands became swelled, and sore to the touch; and he complained frequently of a sense of coldness in the direction of the right ureter, which was succeeded by a painful inclination to make water. From these circumstances it was suspected that the right kidney, if not the chief source of the extraordinary symptoms I have been describing, had at least suffered considerably. He was therefore urged to recollect any external injury he might have received. After a little hesitation he informed us, that about a month previously to his applying for relief, he had received several violent blows from the end of a large rope across his loins, which, for some time, had given him considerable uneasiness. In the course of a few days, however, he said, the pain had gone off, but had returned at intervals; and as he had suffered much, at different times, from gravel, he had ascribed his present complaints to that cause. At the time he made known these particulars, he was in a very reduced condition; his stomach was become so extremely irritable, that it retained but little of what was given to him, either of food or medicine; and about a week afterwards he died. — On dissection, the urethra was found to be in a healthy state, but the prostate gland was a little enlarged. The bladder contained about eight ounces of turbid urine, mixed with a purulent fluid, very offensive to the smell. The right  
ureter

ureter was much enlarged, and filled with the same kind of foetid matter. The kidney on the same side was enlarged nearly to thrice its natural size, and on being opened, was found to be in a state of suppuration, and to contain a considerable quantity of foetid pus, so that the internal substance of the kidney was, in a great measure, destroyed. There was no appearance of calculus; and the other kidney, as well as the rest of the abdominal viscera, appeared to be in a natural state. — It may be doubted, perhaps, whether the affection of the kidney, in this case, ought solely to be attributed to the effects of the blows that were inflicted; but allowing the kidney to have been previously diseased, (and the complaints the patient had already experienced, and which he attributed to gravel, render it not improbable that it was so,) still their cause, I think, be no doubt that the suppurative process which took place was hastened, if not immediately occasioned, by external violence. And of suppuration of the kidneys from external injury, in any respect similar to the present, I have been able to meet with no example in books. Different systematic writers do indeed enumerate external contusion among the remote causes of nephritis; but I do not find, in any of them, an instance of such an affection from such a source; so that I flatter myself the case I have related will be thought worthy of being recorded. It shows, that a frequent inclination, without ability, to make water, is not always occasioned by gravel or calculous concretions; and it affords a striking instance of the influence an organ, like the kidney, may have upon parts not only contiguous to, but even remote from the seat of disease.”

IV. *Case of a gun-shot Wound of the Head.* By the same. — “A Hessian grenadier, aged between thirty and forty years, being one of a detachment sent to reduce a fort on the banks of the Delawar, in the act of levelling his piece, received a ball (grape shot) on that part of the os frontis which forms the external canthus of the



the eye. The ball making its passage through the head, came out under or rather behind the opposite ear. — What were the immediate effects upon the receipt of the injury I am not able to say, not being immediately upon the spot; but he appeared, when brought to the regimental hospital, to have a perfect recollection of every circumstance that had occurred to him, except only for a short time after he fell. He complained of little pain, and did not appear to have lost so much blood as might have been expected. The ball being a spent one, had much splintered the cranium, both at its entrance and exit; and was found in the folds of his coat collar. The wounds being cleansed, and the splinters of bone removed, as far as was practicable, from about the external parts, suitable dressings were applied; and his pulse being full, he was let blood; after which he took twenty-five drops of the tincture of opium. The next day he had a sense of heaviness over his eyes; and observed that objects did not appear to him so brilliant as usual; towards the evening, he complained of nausea and thirst. He took *tart. vitriol.* and *antim. diaph.* aa gr. xii every third hour, and a clyster was administered. On the third day he complained of pain of his head, accompanied with drowsiness; and, at intervals, of a weakness of his extremities. As the clysters had failed to procure a sufficient discharge of fæces, he was directed to take three grains of calomel, and fifteen grains of powder of jalap; which operated well, and procured an alleviation of the symptoms just now mentioned. His eyes were but slightly inflamed, and he complained of but little pain in that on the affected side. On the sixth day there was a good discharge of matter from the wound, and escars began to separate in pretty large sloughs. From this time he rested tolerably well without the use of the opiate, which till now had been repeated at bed-time. Splinters of bone, that had been driven in at the superior wound by the ball, came away from the dependent orifice at almost every dressing (which was twice a day) for several days.

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The nausea, head-ach, weakness of his limbs, thirst, and every symptom of fever, gradually vanished; the superior orifice filled up with new granulations, and cicatrized firmly; and in about ten weeks there remained nothing more necessary than a superficial dressing to the inferior opening near the ear. I did not see this man after he had actually left off every application to the affected part; but from the condition of the wound, and the patient's health and vigour, I have not any room to doubt, that in a few days, after I last saw him, he was capable of returning to his duty. — On reflecting on this extraordinary injury, (inasmuch as it was not a mortal one,) I am inclined to think, that as the ball, though a large one, entered low down upon the orbit, and near the external part of the eye, it missed the os planum and frontal sinuses, and consequently that branch of nerves that passes through them; so that, judging from its apparent direction, it must have injured part of the os ethmoides, near the septum nasi. To this course of the ball, and the favourable situation of the dependent orifice, the favourable event of the case was probably owing; for though he complained at certain periods of a sense of weight upon the upper and fore part of the head, general weakness of his limbs, and loss of sight, symptoms indicating an oppression of the brain; yet, upon opening the wound, and giving vent to the matter, which was in some measure confined by the dressings, those symptoms gradually vanished, and the patient always became perfectly easy after the application, for a few minutes, of a warm fomentation."

An instance of a ball, entering under the right eye, and passing obliquely through the cerebrum and cranium, without hurting the eye or sight, is recorded by Heister, in his Medical, Chirurgical, and Anatomical Cases and Observations.

V. *An Account of some extraordinary Symptoms which were apparently connected with certain morbid Alterations about the Veins and Nerves.* By Mr. J. Pearson, Surgeon of the Lock Hospital — Mrs. P. aged fifty-one



one years, of Mile's Lane, Cannon Street, began to suffer from a peculiar uneasiness at the inner part of her left leg, about seventeen years ago, when she was in the third month of her second pregnancy. The skin which covered the particular seat of her complaint, retained its natural colour; but there was a circular induration, of about half an inch in diameter, very little elevated above the surface, which was exquisitely painful when slightly touched or compressed; this morbid part was situated in the course of the vena saphena major, and about six inches above the joint of the ankle. Besides the acute pain which was produced by inadvertently touching this little tumour, Mrs. P. commonly suffered several paroxysms of pain every day; each of these attacks was accompanied with an increased redness, and a sensible elevation of the indurated part, the pain at the same time extending to the knee, and often darting to the stomach; the duration of the fit was about twenty minutes: it was attended with slight convulsive motions of different parts of the body, and frequently terminated with flatulent eructations. These fits of pain did not recur at any regular periods; so that the number which she underwent in the course of a day was various and uncertain; for a disordered state of the stomach, or a sudden perturbation of mind, would at any time excite one of the paroxysms. She also had observed, that the severity of her sufferings was invariably increased during the periods of menstruation and of pregnancy; and that in the latter months of gestation, the duration of each recurrence of pain was extended to an hour and a half. But although this disease was uniformly aggravated by certain alterations in the state of the uterus, yet it continued, with undiminished severity, after Mrs. P. had ceased to bear children; for when her youngest child was no more than six years old, she had not experienced any abatement of her daily sufferings. About thirteen years ago, I advised her to have the morbid part removed; but at that time she was unwilling to undergo an operation; she, however, submitted

submitted to various methods of treatment under the direction of different medical gentlemen, but without obtaining any relief.

On the 27th of April, the lapis infernalis was applied to the morbid part; she endured the most excruciating tortures during several minutes after its application; but the pain gradually diminished with the sensibility of the part, so that in about twenty minutes the eschar was completely formed, and she then felt no more pain than what is the usual consequence of a caustic applied to any part of the body. From this day she never experienced the recurrence of a single paroxysm of pain; the eschar exfoliated in about twelve days; and on the 7th of June the fore was perfectly healed.

On this case Mr. Pearson offers several judicious observations. It appeared, that a portion of the vena saphena major, and that branch of the crural nerve which accompanies it in its course down the inside of the leg, were completely included within the tumour. After the separation of the eschar these parts came in view; and, on touching the extremity of the nerve with the probe, the patient complained of an acutely painful sensation, similar to that she had been accustomed to feel before the tumour was removed. On the nerve being destroyed by lunar caustic, no more uneasiness was suffered. Mr. Pearson therefore concludes, that the vein and nerve being confined within a substance that could not be easily distended, whenever the vein became preternaturally turgid, the nerve was compressed between its parieties and the internal surface of the induration; and that consequently the symptoms were connected with this state of the part. In confirmation of his idea, that pressure was the cause of the symptoms in this case, Mr. Pearson has brought forward, from different authors, several cases somewhat similar to the above.

VI. *An Account of the Extraction of an extraneous Substance from the Rectum.* By Mr. W. Blair, Surgeon of the Lock Hospital.



VII. *A Case of Aneurism of the crural Artery.* By Mr. T. Forster, *Surgeon to Guy's Hospital.* — The treatment, adopted with success, was the same as in two former cases, which were published in the fifth volume of *Medical Tracts and Observations*.\* The tumour, however, in this case was situated near that part where the crural artery dips under the triceps muscle. The ligature on the artery was made about an inch below where the profunda is usually given off. This case differed also from the other two, in the tumour being completely absorbed in seven weeks, the patient having then acquired a perfect use of the limb; whilst in the former, the tumours, though lessened and free from pulsation, still remained.

VIII. *An Account of a Key Instrument of a new Construction; with Observations on the Principles on which it acts in the Extraction of Teeth, and on the Mode of applying it.* By Mr. Robert Clarke, *Surgeon, at Sunderland.* — The alteration here suggested we think will be found a very useful one. The handle of the old key instrument being straight, the elevation of a tooth from the socket, a grinder, for instance, would, if turned outwards, be exactly perpendicular to the jaw; of course, the most favourable that could be for raising; but if the tooth be to be turned inwards, the foreteeth would so much elevate the handle of the instrument as to raise the tooth in the direction of an inclined plane, and of course it would be pressed against the tooth behind, which would add to the resistance, and perhaps occasion two to be displaced at the same time. The modern key instrument, where the shank is bent downwards near the claw, is subject to the same inconvenience: the axis of the bolster, and axis of the shank, making an angle with each other, the elevation of the tooth is in a plane, inclined to the throat, instead of a vertical elevation; on which account the bolster is inclined to shift its situation on the gums, and to press only on the corner.

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\* Vide *Medical Review*, vol. i. page 286.

To remedy this imperfection, Mr. Clarke has had the instrument made with a bend in the shank, to clear the fore teeth, and to allow its proper application.

IX. *An Account of a new Species of Swietenia (Mahogany;) and of Experiments and Observations on its Bark, made with a View to ascertain its Powers, and to compare them to the Peruvian Bark, for which it is proposed as a Substitute.* By Wm. Roxburgh, M. D.—The species of *Swietenia* described in this paper, and which Dr. Roxburgh names *Swietenia Febrifuga*, is a native of the mountainous part of the Rajamundry Circar, north of Samulcottah and Peddapore. It is a very large tree, known among the Hindoos by the name *Soymida*. The bark of the trunk and large branches, of large and middle-sized trees, is covered with a dark rusty-coloured coat, of about an eighth of an inch in thickness, which cracks in various directions, and sometimes peels off in irregular pieces, according to the directions of the cracks. Immediately under this is a very firm, but brittle coat, of about three-eighths of an inch in thickness. When first cut, it is light-coloured; but on drying, or even exposure to the air for a few minutes, it turns to a reddish brown. The inner laminae are thin, consisting of tough, lighter coloured layers. The bark of the younger branches is not cracked, is pretty smooth, of a much lighter colour, and has not the rusty coat above described, but has often many blotches of various coloured lichen over it; it consists wholly of the brown, solid and inner layers. The outer rust-coloured layer of the trunk has but little taste; the other two possess a little aromatic smell, and their taste is very bitter and astringent, accompanied with something aromatic, but in a trifling degree. There is nothing disagreeable in the taste, more than may be expected from a pure, simple, strong bitter and astringent united. The middle laminae are easily reduced to a very fine rose or light brown-coloured powder.

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The astringent and bitter qualities of this bark are said to be much more intense than those of Peruvian bark. From a careful analysis, Dr. Roxburgh ventures to draw the following conclusions:—1. That the active parts of the bark of this species of *Swietenia* are much more soluble than those of Peruvian bark, but particularly in watery menstruums:—2. That it contains a much larger proportion of active (bitter and astringent) powers, than Peruvian bark.—3. That the watery preparations of this bark remain good much longer than similar preparations of Peruvian bark.—4. That the spirituous and watery preparations bear being mixed in any proportion, without decomposition.—5. That the bark in powder, and its preparations, are much more antiseptic than Peruvian bark, or similar preparations of it.—Now, since this bark yields so much of its virtues to cold water, as to preserve flesh from corruption, in a hot climate, with the thermometer from  $87^{\circ}$  to  $102^{\circ}$ , it is reasonable, he contends, to suppose it will yield still more of its tonic and antiseptic virtues in the stomach, where it meets with the most powerful solvents: we have therefore, he thinks, much to expect from it in the cure of gangrene and other putrid diseases. From the evident qualities of this new bark, and from the successful experience he has had with it in intermittent fevers, &c. Dr. Roxburgh has every reason to imagine it will prove equal, if not superior, to the Peruvian bark, for every purpose for which that medicine is used.

X. *An Account of the Effects of Mabogany Wood in Cases of Diarrhœa.* By Mr. Francis Hughes, Surgeon of the General Infirmary at Stafford. — This was used both in decoction and extract, and the author says, with considerable effect. The decoction was prepared by boiling one ounce of the shavings in two pints of water, to one pint. From one to two ounces of this were given three times a day.

XI. *An Account of some Discoveries made by M. Galvani, of Bologna; with Experiments and Observations on them.* By M.

M. Volta.—This paper is extracted from the Philosophical Transactions for the year 1793. The full account we gave of this subject in our last number precludes any particular account of the present, which contains nothing new.

XII. *Return of the Ship's Company, and of the Military on board the Ships in the Service of the Honourable the United East-India Company, for the Years 1792 and 1793.* By John Lorimer. M. D.—The result appears to be as follows: of 2657 seamen, in the outward voyage, 1253 were sick, of which number 28 died—Of 2701 on the homeward passage, there were sick, 1058, of which 51 died—Whilst in port, there were sick 1533, of which 96 died—Of 3929 recruits, outward, there were sick 1751, of which 50 died—And of 1375 invalids, homeward, 282 were sick, and 27 died.

XIII. *An Account of a singular Case of Ischuria, in a young Woman, which continued for more than three Years; during which time, if her Urine was not drawn off by the Catheter, she frequently voided it by Vomiting, and, for the last twenty Months, passed much Gravel by the Catheter as well as by Vomiting, when the Use of that Instrument was omitted, or unsuccessfully applied. To which are added some Remarks and physiological Observations.* By Isaac Senter. M. D. of Philadelphia.—This extraordinary account is extracted from the Transactions of the college of physicians of Philadelphia, and has been already noticed in our Review.\*

Art. XXIII. *A Guide to Health; being Cautions and Directions in the Treatment of Diseases. Designed chiefly for the Use of Students.* By the Rev. Joseph Townsend, 8vo. 400 pages, price 6s. boards. Cox, London. 1795.

THIS treatise is in great measure a translation of the Nosologia Methodica of Dr. Cullen, together with an investigation of the causes, and general indications in

\* Vide Medical Review, vol. i. page 49.



in the cure of diseases. It is altogether an elementary work, and contains very little original matter.

By transcribing the Introduction to the work we shall be enabled to give the reader a general idea of the performance.

‘ Diseases,’ he remarks, ‘ may be reduced to four classes. — 1. PYREXIÆ. 2. NEUROSES. 3. CACHEXIÆ. 4. LOCALES. — Of which the subsequent are the distinctive characters.

1. PYREXIÆ. *Febrile diseases* — After cold shivering a frequency of pulse, with increase of heat and thirst.

2. NEUROSES. *Nervous diseases* — Affections of sense and motion disturbed; without either idiopathic pyrexia or topical disease.

3. CACHEXIÆ. *Cachexies* — A depraved habit of body, without pyrexia or neurosis, as original diseases.

4. LOCALES. *Local diseases* — Morbid affections, which are partial.

When therefore a disease presents itself, the medical student must carefully examine to which class it may be referred. — If, for example, he finds a frequency of pulse, with increase of heat succeeding cold shiverings, the disease must be clearly referred to the class *Pyrexia*.

Having thus traced it to the class, he will proceed to investigate the order. — The orders of this class have been reckoned five; they should be only four. 1. FEBRES. 2. PHLEGMASIÆ. 3. EXANTHEMATA. 4. HEMORRHAGIÆ. — Of which the pathognomic symptoms are the following:

1. *Febres*. Pyrexia, with loss of appetite, and diminution of strength, but no primary local affection.

2. *Phlegmasiæ*. Pyrexia, with topical pain and inflammation.

3. *Exanthemata*. Contagious diseases, beginning with fever, and followed by an eruption on the skin.

4. *Hemorrhagiæ*. Pyrexia, with a discharge of blood, without any external injury.

Let the student, having traced a disease, for instance, to the class *Pyrexia*, suppose, that with the frequency

of pulse and increase of heat, after cold shiverings, he meets with loss of appetite and diminution of strength, not attended by an eruption on the skin; in this case he would refer the disease to the order FEBRES. Of the order *Febres* we have two genera —

1. FEBRIS CONTINUA. *Continued Fever* — No intermission, yet subject to exacerbations twice in one day.

2. FEBRIS INTERMITTENS. *Ague: Intermittent Fever*. — Cold, hot, and sweating stages in succession, attending each paroxysm, and followed by an intermission.

*Quotidians* usually come on in the morning, at an interval of about twenty-four hours. *Tertians* at noon, at an interval of about forty eight hours. *Quartans* in the afternoon, with an interval of about seventy-two hours.

Although, strictly speaking, we have only two genera of the order *Febres*, I shall here venture, with most nosologists, to introduce a third; confessing at the same time, that loss of appetite, a characteristic symptom of the order, is not essential to this genus.

3. FEBRIS HECTICA. *Hectic Fever* — Has exacerbations at noon, but chiefly in the evening, with slight remissions in the morning after nocturnal sweats; the urine depositing a bran-like sediment. Thirst moderate.

Should then a case present itself, which the student, from the characteristic symptoms, has referred to the class *Pyrexia*, and to the order *Febres*; and should he, in this disease, remark no intermission, although it be subject to exacerbations twice in one day, he cannot be at a loss to ascertain the genus, but will consider it as a *Febris Continua*. — Should he observe cold, hot, and sweating stages in succession, attending each paroxysm, and followed by an intermission, he will not hesitate to pronounce it *Febris Intermittens*. — Should he, with pyrexia find moderate thirst, the evening exacerbations with the morning sweats, but no intermission; and should he observe a bran-like sediment in the urine; he may be certain, that his patient has an *Hectic*.

In order to give a clearer idea of the subject, the author here gives us a case of what he calls *bilious autumn-*



*nal fever*, which began as *synocha*, with inflammatory symptoms, and terminated in *typhus*, with symptoms of putridity. From the long and minute description of circumstances and sensations, it is probably his own case, which is here recited. It may, however, be doubted how far the mind of a patient, under such circumstances, is capable of accurate discrimination. — Judging from the whole train of symptoms, as here related, it appears to us, that the protracted duration of the disease to the twentieth day, and the appearances of exhaustion, which took place towards the latter end, are at least as attributable to the stimulating plan of treatment adopted in the beginning, as to the disorder itself.

We observe here none of that nice discrimination, and cautious deduction which characterize the experienced and attentive practitioner. On the contrary, proximate causes are assigned on insufficient grounds, and hasty practical inferences drawn, in a way very commonly observed in the inaugural dissertations of the Tyros in medicine. Indeed, what else could be expected from gentlemen who make the practice of medicine their amusement only, and who find leisure for Travels and Voyages of pleasure?

‘ We have seen,’ observes Mr. Townsend, ‘ that the powers to be exerted by the *cinchona*, and to be applied in medicine, are antiseptic and astringent. Let us then consider the operation of our English bark, when applied as an antiseptic and astringent in the art of tanning, *that we may distinctly comprehend its power on the animal fibre*’. We apprehend few cautious practitioners will think the calling the Peruvian bark *antiseptic* and *astringent* a sufficient explanation of its medical powers, or that its operation on the animal fibres is to be inferred from the operation of oak bark in the tanning of hides, or, as he afterwards asserts, that the decoction of the oak bark has been given with efficacy equal to that of the *cinchona* in the cure of intermittents.

We must not omit the author’s explanation of the proximate cause of fever. ‘ For the proximate cause

‘ I would assign the morbidly increased irritability of  
 ‘ the heart and arteries; and this with either strong  
 ‘ marks of vascular excitement, or with symptoms of  
 ‘ nervous weakness and distress; the former constitut-  
 ‘ ing *synocha*, the latter *typhus*’ — ‘ If it be inquired,  
 ‘ what produces the increased irritability of the heart and  
 ‘ arteries in fever, I shall not hesitate to offer another  
 ‘ conjecture to the world; happy, however, in not be-  
 ‘ ing the first publicly to hazard that opinion, although  
 ‘ it has been deeply impressed upon my mind for thirty  
 ‘ years. It appears to me, that the increased irrita-  
 ‘ bility of the heart and arteries in fever arises from  
 ‘ consent of parts and the stimulus of acid bile, indi-  
 ‘ gested food, viscid and corrupted mucus, worms,  
 ‘ virus, and other stimuli in the *stomach and first pas-*  
 ‘ *sages*: because in proportion as these have been re-  
 ‘ moved, fever has been relieved, either ceasing alto-  
 ‘ gether, or being made to intermit, or at least ren-  
 ‘ dered mild and tractable, whilst it has proceeded in  
 ‘ its destined course.’ — ‘ Should we in typhus suffer  
 ‘ putrescent colluvies to stagnate in the alimentary ca-  
 ‘ nal, we shall have then no longer what is called a  
 ‘ *nervous*, but a *putrid fever*.’ — Will any one think  
 himself enlightened on the subject of fever by this *ex-*  
*planation*? not to mention that the pulse is at times pre-  
 ternaturally slow in fever, (for which fact we have the  
 authority of Dr. George Fordyce) which we imagine  
 will hardly be supposed to indicate excess of irritability  
 in the vascular system, we would ask Mr. T. how this  
*morbidly increased irritability* can be attended with  
 strong marks of *vascular excitement*, if the assertion be  
 true which he elsewhere makes, p. 57. ‘ that *debility*  
*and irritability are as intimately connected, as the cause*  
*with its effect?*’

It were easy to enlarge on this subject. Had our pro-  
 vince been criticism only, abundant matter might be  
 found throughout the volume to exercise a talent of this  
 sort upon.



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THE  
MEDICAL and CHIRURGICAL  
REVIEW.

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NOVEMBER 1795.

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ART. XXIV. *Medical Histories and Reflections.* By J. FERRIAR, M. D. *Physician to the Manchester Infirmary and Lunatic Hospital.* — 2 vol. 8vo. price 9s. — CADELL. London, 1795.

THE first volume of these observations was published in the year 1792. Several of the histories contained herein have a relation to those in the second volume, and are in themselves important; we shall therefore be excused in giving an account of the first volume, though at a late period. It contains a selection of cases and observations, chiefly drawn from the author's practice, at the Manchester infirmary; a situation which gave him ample opportunities for the investigation of the nature of diseases, and their appropriate treatment, and which he has not failed to improve.

The first case related is of a middle aged man, who was suddenly affected with a tingling pain, succeeded by numbness, in the thumb and fingers of his right hand. In a few minutes the parts became black, and the pain, extending along the arm and shoulder, darted into the right side of the mouth, just at the angle of the lips. He immediately felt his speech impeded; and he articulated with great difficulty, and very imperfectly, till the fit was over, which was completed in the course of half an hour. The paroxysm returned once in two or three hours, observing precisely the same course. His head was not affected, during any part of its duration,

ration, either with pain or giddiness; nor had any indications of a paralytic disorder preceded the attack. His bowels were in a regular state; his tongue was white. A blister was applied to the outside of the fore arm, in the direction of the radius, with the view of stimulating the principal nerves supplying the fingers, and a gentle laxative was also prescribed. As soon as the blister produced an effusion, the fits left him. A day or two after the application of the blister he complained of a slight head ach, with the pulse full and strong, which was removed by the loss of twelve ounces of blood.

The next is a spasmodic case, successfully treated by large doses of opium, musk, and camphor.

This is followed by the relation of fifty cases of dropsy, for the purpose of ascertaining the comparative merits of the different diuretics administered in this disease. The remedies employed were digitalis, cream of tartar, Bacher's tonic pills\*, pulvis doveri, gamboge with cream of tartar, gamboge with mercury, calomel with squills, and nicotiana. Instead of detailing cases, we think it better to give the general result and observations of the author.

Of forty-seven patients, whose cases are here related, twenty-two have been cured, seven received no benefit, and ten died. The comparative merits of the different diuretics are stated as under —

1. "Of twenty-four patients who took digitalis, nine were cured; two were relieved; four died, and nine were not relieved. Of these cases, two were anasarca; seven were instances of ascites, two of hydrothorax; the rest were complicated; and, in almost all the fatal instances, there was water in the chest. I have given this medicine in some other cases, where it did not succeed; but as the patients were in a dying state when I was called to them, it would be unfair to insert them.

"Yet it must be observed, that in some of the instances I have given, which terminated fatally, notwithstanding the use of digitalis, the patients appeared to be

\* Consisting principally of the melampodium.



be in that state, which Dr. Withering describes as most favourable to the action of that medicine. Hartley, Williams, and Newton, were examples of this.

“ Respecting the particular operation of digitalis, in those cases, it may be remarked: —

*a* “ That where it proved successful, it gave relief early, and in small doses; this appears from the first eight cases, and from that of Lee’s.

*b* “ That when given in such quantities as to excite nausea, or to produce evident narcotic effects, it does not operate as a diuretic. Johnson took it in such doses as to make him very sick, and Williams continued it to four grains a-day, till his head and pulse were considerably affected, without passing a drop more of water. These facts correspond with Dr. Withering’s experience, so that it is needless to dwell on them\*. I have had such repeated conviction of the first observation, that, if digitalis does not answer within the first week, I exchange it for some other diuretic, or interpose a cathartic, composed of gamboge and cream of tartar. I was led to the latter expedient, by observing, in Williams’s case, and another in private practice, that the narcotic effect of the digitalis, in a long use of it, seemed to preclude its action as a diuretic. The same consideration had occurred to Dr. Stokes†. Gamboge was long celebrated for its hydragogue powers, but appears to have fallen into disgrace by the indiscretion with which it was exhibited. Some of the older writers talk of giving sixteen grains for a dose‡. I have found it very safe and manageable in small quantities; sometimes four grains have been necessary to operate four or five times in a young subject. In conjunction with

X 2

cream

\* Dr. Withering observes (p. 185.) that a diarrhœa, supervening on the use of foxglove, stopped its diuretic effects. It has been asserted, that a purging always impedes the flow of urine, in dropsies, however excited. V. Wilkes on the Dropsy, p. 213.

† Dr. Withering’s Account of the Foxglove, p. 150.

‡ Wilkes on the Dropsy. Art. *Purges*. Sydenham orders fifteen grains of gamboge, in a draught, in the processus integri, as a very gentle cathartic.

cream of tartar, it forms a powerful diuretic, and according to circumstances, may be made either to assist, or take the lead of the digitalis. I believe, that by this combination of the remedies, a flow of urine may very generally be commanded.

c “ When digitalis fails, other diuretics will often succeed. This appears from the cases of Williams, Jelly, Bowers, Johnson, and several of the rest.

d “ When digitalis does provoke an increase of urine, the swellings are not always proportionably relieved. While Waters was passing a great quantity of urine, and taking six spoonfuls a-day of the infusum digitalis, the swellings of his legs did not diminish. And while Rowbottom’s legs were emptied, a short time before his death, the collection of water in the pericardium appeared to be increased.

2. “ Of ten cases, in which cream of tartar alone was given, according to Dr. Home’s method, six were cured, two died, and two are convalescent. Of these, one was a distinct case of hydrothorax in which all the symptoms were removed, and the patient continued well nearly for twelve months. In another, there was strong reason to suspect the presence of water in the chest; there also the symptoms were entirely taken off. In one fatal case, the existence of hydrothorax was ascertained. Two others were cases of anasarca, one of ascites, another of anasarca and ascites combined.

“ I have to observe, of the peculiar action of cream of tartar:—

a “ That in my successful cases, it operated very early; generally producing an increased flow of urine within twenty-four hours. This was especially remarkable in Mr. C. and Mather. Dr. Home often found its salutary effects delayed to the end of three or four weeks\*. But it is difficult to persuade patients to continue the use of a medicine so long†, without any sensible benefit.

b “ I

\* Clinical Observations, Exper. &c. Art. Remedies of Hydrops.

† I have often found patients object to the quantity of liquid, in giving the solution of cream of tartar. This has obliged me, in



*b* “ I have commonly found it purge the patient four or five times a-day. Instead of increasing the dose, therefore, as Dr. Home directs, I have been obliged to order tonics and cordials, to enable the patient to bear the usual quantity. There is, indeed, great difference between the constitutions of the usual patients at the Edinburgh Royal Infirmary, and those which we have to work here. The natives of Manchester generally bear evacuations very ill. But after patients have continued to use this remedy for some weeks, I have found it necessary to increase the dose to six drachms, an ounce, or more, every day; and have then found it produce only two stools in twenty-four hours. In such cases, its diuretic power seemed to lessen in equal proportion. After Wyatt had long taken an ounce of cream of tartar a-day, she even became costive with that dose, and required the use of gamboge. Several of my dropical patients, however, were strangers: Nield, Mather, Duny, Jelly, and Johnson were Irish.

*c* “ Cream of tartar commonly diminishes the swellings very speedily. It produces very watery stools, and for the greater part, lessens the patients size more quickly than the increase of urine would lead us to expect.

3. “ Of eight cases, in which the melampodium was exhibited, three were completely cured, one is convalescent; two were emptied, and their swellings quite reduced, but died, from circumstances to be explained hereafter. One was not relieved. Another, Johnson, had watery stools, and was reduced in the size of the abdomen, after digitalis, and many other powerful diuretics had failed. In two of these, there was water in the chest, and probably in Johnson. Two were cases of pure ascites; one cured, and the other convalescent. The rest were complicated.

*a* “ The tonic pills, when they have succeeded with me, have operated early, by producing copious watery stools.

X 3

“ *b* Their

in several cases, to have recourse to the combination with gamboge, which may be exhibited in a very small portion of fluid.

*b* “ Their action is easy, but in cases of long standing, contrary to Mr. Bacher’s assertion, they evidently weaken the patient, however cautiously given.

*c* “ Whenever they produce a discharge of water, they reduce the swellings. These two effects, as I shall soon have occasion to observe, are by no means reciprocal in the use of every diuretic.

“ The pulvis doveri was given in only one case. The occasional cause of the disorder led directly to the employment of sudorifics in that instance.

“ Gamboge with cream of tartar gave relief in a case (Bowers’s) which had baffled every other prescription. The patient was cachectic, and there was reason to believe that the viscera were obstructed. The same remedy, in conjunction with calomel, was given in a case of anasarca, and effected a cure very speedily.

“ The combination of calomel with squills was pushed to a considerable extent, with Jelly, because I suspected the condition of the liver. It did not, however diminish the swellings in proportion to its diuretic effect.

“ The tobacco tincture proved a ready diuretic with Coxe. In the two other cases, and in some which I do not recollect with sufficient accuracy to insert, it did no service. But in Coxe’s case, which was evidently a dropy of the ovarium, no benefit could be expected from simple diuretics. The mercurial friction, and spiritus ætheris vitriolici, produced a considerable effect on the disease. The latter, as well as the spiritus ætheris nitrosi, probably increases the urine by the action of its alcohol.

“ In Betty Clay’s case, we have a striking example of the little anti-hydropic power of an active diuretic, the spiritus ætheris nitrosi. She attended me only once in two or three months, and at the end of eight, was as much swelled as ever ; though she had been constantly using this medicine, and though her urine was passing in very unusual quantity. The tonic pills have nearly effected a cure in this case.



“ On reviewing these observations, which were made without choice, and with no predilection for any remedy, the result appears not highly in favour of the digitalis. Yet I esteem it a valuable medicine, and I have always found it safe, by attending to Dr. Withering’s cautions. The melampodium, as given in the form of tonic pills, appears, likewise, to possess virtues that ought not to be neglected. I have employed the cream of tartar in comparatively few cases, but when their nature is considered, and the surprizing proportion of success allowed for, I think we may fairly rank this medicine in the first class of hydragogues. From what I have seen of its effects, I shall hereafter give it a preference in most cases of dropsy, to bring forward a larger testimonial of its real merits. Stronger conclusions may be drawn in its favour, from these cases, because they coincide with the experience of Dr. Home\*. Indeed, if cream of tartar be found to possess only an equal share of merit with digitalis, the former will deserve the preference, as possessing no deleterious qualities, and being easily managed by practitioners of the smallest judgment. In treating of this remedy, Dr. Home has formed a just and valuable distinction, between remedies which act chiefly as diuretics, and those, which at the same time, diminish the fluid effused in dropsies. I have been led to refer to this distinction more than once, in the preceding cases. The doctor’s words are these; ‘ We have found, that oxymel colchici, baccæ juniperi, &c. are much stronger diuretics, but much weaker antihydropsics than cremor tartari. We have seen, that it often neither increases urine nor stool, and yet that it cures†.’ If this difference were more observed, some mortifying disappointments in practice might be avoided.

X 4

Twenty-

\* Clinical Observations, Experiments, &c. page 349.

† Ibid, page 353. The whole passage, which is long, deserves particular attention.

“ Twenty-one of my patients were males, and twenty-six were females. This proportion supports the common opinion, that women are more subject to hydropic affections. Their ages have varied from a year and a half to seventy.

“ In those cases which terminated fatally, where an inspection of the body was obtained, besides the appearance of disease in the viscera, usual in dropical complaints, we have frequently seen the kidneys affected with enlargement, inflammation, and a degree of suppuration. In Rowbottom, besides the disease in the liver, there was an affection of the heart, sufficient alone to produce death. In such instances, dissections prove the impossibility of saving the patient. Yet in several of these cases, much relief was obtained by the use of medicines, and life was not only prolonged, but soothed. The power of an hydragogue never appears greater, to a judicious observer, than when it reduces swellings occasioned by permanent disease in the viscera, although the event of the case should be ultimately fatal.

“ Five of my patients died, in consequence of a diarrhœa, which began when their swellings were greatly reduced. It is an observation of Hippocrates, repeated by all writers\* on this disease, that a diarrhœa, appearing in a dropsy of long continuance, is generally fatal. Johnson, however, had a looseness, almost at the distance of three months from the time of his admission, and yet escaped. In three of the dissections, an evident cause of this symptom appeared; the intestines were in a state of great inflammation.

“ Such a state of the bowels is frequently mentioned by practical writers†, but not as connected with a diarrhœa, nor as following the abatement of the swellings. I am inclined to believe, that this is a peculiar termination of inveterate ascites. We see in some other cases, in the puerperal fever particularly, that inflammation may arise

\* Hoffman, tom. iii. p. 329. Sydenham sub titulo. Lieutaud, Précis de la Méd. Prat. &c.

† Monro on Dropsy, p. 8. and the authors quoted above.



arise in the contained parts of the abdomen, in consequence of the sudden removal of pressure ; and in whatever way that fact may be explained, I apprehend that a similar process takes place, after the reduction of hydropic swellings\*. Hoffman and some others, explain such affections of the intestines from the long-continued action of the effused water on them, which, though a theory of no value, shows their conviction of the reality of the fact. It is evidently of great importance to ascertain in what cases such a termination may be expected, because the practice, in a disease of long continuance, ought to be considerably influenced by it. This view will induce the physician to avoid all stimulating purgatives, and rather to solicit a very gradual discharge of the effused fluid, than to urge the constitution to a degree of action that may increase to a morbid state. There was no particular appearance indicative of this termination; in the cases I have observed, excepting a general irritability of the habit, which always secured the effect of the diuretics administered.

“ In three other fatal instances, death was brought on by gangrene. This is commonly to be expected, in men, when the skin of the penis has become distended and tortuous. Johnson is the only patient whom I have seen survive this symptom. In respect of this state, also, as a probable termination of dropsy, it is evident, that brisk purgatives, in the confirmed stage of the disease, must be very injurious. I should even dread, in such circumstances, the effects of digitalis on the moving powers of the circulation.

“ I have never had recourse to tapping, but when the state of the swellings threatened suffocation. Whenever I have been compelled to employ it, I have found the effusion renewed in great quantity, in the course of forty-eight hours, or within three or four days at the utmost.”

After

\* We must take care to distinguish, however, that in puerperal fevers the peritoneum appears to be first affected. In hydropic inflammation, the villous coat of the intestines is chiefly attacked.

After these valuable remarks on dropfy, the author gives us two cafes of hydrocephalus, which terminated favourably, but which he confiders as fpontaneous cures, little, if at all, affifted by medicine.

Of the *uva urfi* the author obferves, that he has given it in a confiderable number of nephritic cafes, and always with manifelt advantage. The dofe he ufually employed was five grains only, and he has never found larger dofes neceffary.

On the fubject of *hysteria* the author obferves, that men are frequently attacked by complaints which approach to the hysteric type; two inftances of which he has adduced.

We have next a cafe of *diabetes*, arifing in a patient who had accuftomed himfelf to the free ufe of fpirituous liquors, cured by a courfe of bark, with elixir of vitriol.

*An Account of an epidemic Fever, which prevailed at Manchester, in the years 1789 and 1790.* — Befides an accurate defcription of the difeafe, we find feveral important remarks, tending to prove the effect poverty, and its concomitants, impure air and crouded rooms, have in giving rife to, and perpetuating contagious difeafes; likewise feveral judicious regulations of police are fuggelted; which, if adopted, would probably render both lefs frequent, and lefs fatal, diforders of this kind, which are now fo prevalent in manufacturing towns.

Preternatural enlargements of the heart, and great blood veffels appear to be more frequent, Dr. Ferriar obferves, than authors would lead us to fuppofe. In the courfe of two years he has feen a confiderable number, many of which are here related. He has generally found them accompanied, he fays, with dropfical fwellings, and much flatulence; frequently with a cough and fpitting; almolt always with oedema of the



the face. There is sometimes violent pain across the breast, attended with frequent deliquium; sometimes the pain is felt across the lower part of the abdomen, especially when a degree of inflammation has taken place in the heart. The progress of the disorder is very unequal. Sometimes the palpitation is so violent, that the patient seems ready to expire; yet in the course of a few hours, it will abate, and the patient will be able to walk out of doors, insomuch that the disease frequently seems to be in a retrograde state. A patient under my care, with a considerable dilatation of the heart, after having undergone violent pains across the thorax, succeeded by fainting, is now, at the end of a year and a half from the beginning, considerably easier, and has been for some time free from pain and deliquium. Lastly, death often happens suddenly, in such cases, without any rupture of the heart.

When the apex of the heart strikes very low, it always gives the impression of a much greater dilatation than actually exists. The stroke will be felt, for example, between the eighth and ninth, or the ninth and tenth ribs, when the ventricles are very little enlarged beyond their usual size. The most certain sign of dilatation, is the jarring sensation given to the hand, by each systole. The stroke seems restrained, and is succeeded by a kind of thrilling, which cannot be clearly described, but is entirely different from the shake of a palpitation. It is necessary to be very cautious in deciding whether an enlargement exists, for I have known the common palpitation in chlorosis pronounced a dilatation of the heart, and the patient nearly destroyed by the consequent mode of treatment. The pulse is very irregular; sometimes feeble, small and intermitting; sometimes extremely quick and hard; or jarring, like the systole of the heart itself. When the palpitation is violent, the head is affected with strong distressing pulsations, which patients often compare to the strokes of a large hammer. I have sometimes found this palpitation in the head more uneasy, and more complained of,

of, than that of the heart, even when the latter was evidently dilated. Fainting fits often attend this stage of the disorder.

*The muriated barytes*, which has been so much extolled, has failed in Dr. Ferriar's hands. He never found any sensible effect from it, even in doses of twenty drops, given twice or thrice a day; excepting in two cases. In these two instances, where it appeared to do service, the good effect was not very remarkable. Dr. Ferriar suspects, that the only benefit to be expected from it, must arise from the action of the acid, either not completely saturated, or not destroyed as a tonic, by the mineral, as he found several patients receive apparent benefit from the acid alone, who had used the muriated barytes without effect.

The situation the author held in the lunatic hospital, must have afforded him opportunity of making many valuable observations on *insanity*. The medicines which have been recommended in this affection, by different writers and practitioners, form the subject of one of these essays. With regard to *tartar emetic*, he remarks, that although it be at present in frequent use, in nauseating doses, as a remedy in mania, he has himself used it in six cases, in two of which the patients were extremely furious, and found it of little efficacy, excepting in one instance.

*Camphor* he has found useless in these disorders, in all kinds of doses. He has given it, with great attention, in eight cases, without any advantage.

*Opium and digitalis* have been equally ineffectual in his hands.

*Antiphlogistic regimen.* Many maniacal patients bring on their disorder by hard drinking. In such cases, low diet, and saline purgatives generally restore health in a moderate length of time.

In cases of deep melancholy, where there was evidently a relaxed state of the solids, and in maniacal paroxysms, where appearances resembled those of the low delirium in fevers, Dr. Ferriar has employed the  
*bark,*



*bark*, combined with opium and aromatics, with the best effects.

*Bathing.* The repeated use of bathing, either warm or cold, is strongly recommended by the best writers. In cases of melancholy, Dr. Ferriar commonly uses the latter, in mania the former. If a maniac be continued in the warm bath for a considerable time, he will become entirely passive. Immersion for half an hour, exempting the head of course, commonly produces this effect.

*Drains.* Melancholy and mania are sometimes produced by the suppression of habitual eruption, or discharges, and sometimes cured by restoring or imitating them. Of this, some instances are adduced.

*Bleeding and topical evacuations.* General blood-letting, the author remarks, is a valuable remedy in young plethoric subjects, when the patient is not totally unmanageable. Repeated bleeding, though so strongly recommended by Sydenham, would, in Dr. Ferriar's opinion, be hazardous; for he has often had occasion to remark, that the strength of a maniac is easily, and sometimes suddenly reduced, by evacuating remedies.

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The remarkable operation of *digitalis*, in retarding the pulse, naturally suggested its use in cases of active hæmorrhage. Four cases of hæmoptoë are adduced, where its good effects were remarkable. It appears to be particularly indicated, where a tendency to relapse is preserved, after the usual methods of checking the evacuation have been carried as far as prudence, and the strength of the patient will justify.

A single case of hydrophobia is next related, which has already appeared in the first volume of *Medical Facts and Observations*. We are sorry to say, it affords nothing to induce us to hope for success in the treatment of this dreadful malady.

The

The last essay in the present volume is on the origin of contagious and new diseases. This is not strictly medical. Its design is to point out the sources of disease among the poorer and manufacturing classes, hereby to prevent, as far as possible, by wholesome regulations, the rise of contagious fevers, and perhaps of new diseases. A subject in which the higher ranks of society are nearly as much concerned as the lower. “The safety of the rich,” the author well observes, “is intimately connected with the welfare of the poor, and a minute and constant attention to their wants, is not less an act of self-preservation than of virtue. For we are not less exposed now to the ravages of disorders, the poisons of which are perpetuated in the abodes of misery, but we are threatened with the rise of new contagions, the danger of which cannot be foretold, nor perhaps the remedies easily ascertained. In this the true danger of luxury consists, which I think authors have too much overlooked: the excesses of an individual, in their direct consequences, affect only himself and his family: but when voluptuous habits induce him to withhold his real superfluities from the indigent, he contributes to the diseases and destruction of thousands.

“Accident and misfortune have too often done those services to mankind, which wisdom would not have been permitted to render. The fire of London extirpated the plague in this country; and even the blow of an assassin once proved a salutary remedy. Perhaps some such extraordinary circumstances must do for us, what it is in our power to do for ourselves, in disarming the virulence of animal poisons, by increasing the happiness of our fellow creatures. To imagine, that by any human prudence, all misery (even from indigence) can be relieved, or all contagion destroyed, would be ridiculous; but as events, unexpected, or certainly not promoted with this view, have abated the frequency and violence of some epidemics, I see no reason to doubt, that prudence, by imitating such operations,  
may



may still farther lessen the evils of disease. In any event, a closer attention to the comfort of the poor, than is commonly practised, is a desirable object of attainment ; and it may excite the benevolence of some men, if they can be convinced, that acts of charity will not only serve them in another life, but promise them a longer enjoyment of the present.”

In our next number we propose giving a full account of the second volume of this valuable work.

ART. XXV. *Observations on morbid Poisons, Phagedæna, and Cancer: containing a comparative View of the Theories of Dr. Swediaur, John Hunter, Messieurs Foote, Moore, and Bell, on the Laws of venereal Virus: with some preliminary Remarks on the Language and Mode of Reasoning adopted by medical Writers.* By JOSEPH ADAMS, Surgeon. — 8vo. 328 p. price 5 s. — JOHNSON, London, 1795.

THE confusion which has arisen in medicine, from the use of terms, to which no precise meaning has been affixed, is almost incalculable. The progress of the science has been beyond measure retarded, from authors expressing themselves in language, which probably they themselves had not defined, and which had been understood by a thousand different readers in as many different ways. Mr. Adams has produced a number of instances, both ancient and modern, which serve to prove this. He has brought these forward, indeed, with some degree of warmth and asperity ; but this will be excused him, when the prevalence and great importance of this fault, in medical writers, is considered. It is much to be wished, that the language of medicine underwent a thorough reform. In no science is it more necessary than in this. Until this be effected, it may be allowed the satirist to lash the person, as the only means at present of correcting the thing. How many

many ages; observes Mr. Adams, was the term, “hereditary disease,” current among the learned, till Mr. Hunter shewed there was no such thing in nature as an hereditary disease, but that a disposition to a disease was often hereditary!

The term, *schirrus*, is also adduced by the author, as a striking instance of the want of precision in medical language. If the reader considers its etymology, he will find it very well applied to an indolent tumour, peculiarly hard; in general language, often to any of the viscera indurated by chronic inflammation. In a closer sense he will find it confined to that species of tumour which agrees with Dr. Cullen’s description of it in his *Nosologia*; *ordo*—*Partis magnitudo aucta sine Phlogosi*. *Genus*. *Partis, plerumque glandulæ, tumor durus, non dolens, ægre suppurans*. The other nosologists use, for the most part; the same language, except Linnæus, who makes no reference to a cancer; yet Dr. Fordyce considers it as one of the terminations of inflammation. Most authors consider cancer as the sequel of *schirrus*. Boerhaave seems to have been so seduced by his own language, that he advises us, by all means, to abstain from stimulating applications to a *schirrus* liver, lest we produce a cancer; and Vanswieten enforces his preceptor’s advice. Yet neither of them pretend ever to have seen a cancerous liver; nor is any better authority produced for such a disease than a dissection, related by Bonetus, from Bellonius. It must be admitted, that so cautious has Morgagni been in this respect, that among the number of cases related of indurated liver, he never once uses the term *schirrus*. Some anatomists, who are no less accurate in this respect, do not scruple to apply the term to that enlarged state of the prostate, which is among the calamities of old age. But surely it wants the characteristic mark of ever terminating in cancer. In how few cases, where this gland has continued for years, in an enlarged state, is suppuration found; or when ulceration has commenced on the interior surface, do we find an internal suppuration with a  
circumscribed



circumscribed hardness, like what is met with in the cancerous breast or testis? Do we hear the patient complain of lancinating pains, or any other uneasiness, than what arises from the mechanical obstruction at the neck of the bladder? Here, however, the etymology of the word being consistent with any one of the senses in which it is used, we have only to regret, that authors will not be careful to give a definition of their terms, or refer us to such of their predecessors, whose language they are contented to adopt.

If Sydenham relates the symptoms of a disease, who, that wishes for information, is not concerned when he arrives at the conclusion? If the same author begins to assign the causes of symptoms, who has patience to read of the ebullition of the blood, the concoction, digestion, and separation of the inflamed particles, &c. in the small pox — of the subtle matter of the plague, which being free from the grossness of the variolous matter requires no previous digestion, nor any ebullition to procure it? — A great deal more of the same kind is brought forwards, from the works of living authors, which our limits prevent us from entering into.

The third and four following chapters contain observations on the morbid poisons, which he defines, the secretions of animals, the effect of disease, capable of conveying a diseased action from one animal to another of the same, or different, species. His ideas on this subject, the author candidly acknowledges to have been, in great measure, derived from Mr. Hunter. The facts on this subject are as yet too few to ground a system on, or to enable us to discover the general laws by which they are governed; but every attempt at generalizing those facts will at least have the effect of keeping up an attention to the subject, and thus tend ultimately to its improvement.

Morbid poisons may be applied either by vapour, contact, or wound. The first usually produce fever; which, if the patient is able to struggle through the stages of it, subsides of itself. Those which affect, by

wound or contact, produce a local disease, which sometimes only extends itself by the diseased action being kept up in the part; at others, affect various parts of the body by absorption. The hydrophobic poison is an exception, being given by contact, and producing a critical fever. The small-pox, and perhaps most of the poisons producing eruptive fevers, may be communicated by contact, or vapour. In the morbid poisons, the quantity applied, provided it be sufficient to produce the consequent disease, does not seem to lessen or increase it.

‘ For a morbid poison to produce its full effect, the subject that receives it must be susceptible of the diseased action it occasions. The part to which it is applied, or the constitution, must take on a disposition to the diseased action, and nothing must interfere to prevent the action taking place.

‘ The susceptibility depends on the constitution, or the state of it at the time the poison is applied. If the constitution is susceptible, the local *disposition* will take place on the application of the poison, and the action follow in a certain period. From this, as soon as matter is absorbed, the constitutional disposition will follow; but the diseased *action* will not take place till a certain period, according to the laws of each individual poison.

‘ The susceptibility is confined for the most part to distinct species of animals, as the mange to dogs, the rot to sheep, and a great variety to men. This is, I believe, liable to only the single exception of the hydrophobia. But all men, and probably other animals, are not susceptible of the poisons peculiar to their species. Some men pass through life without feeling the effects of the variolous infection, and still more without that of the venereal, though exposed to it as much as the greatest sufferers. Many are susceptible at one time and not at another. Some have even shown a susceptibility of the local, and not of the constitutional infection, or absorption has produced no consequent disposition to the disease. In some, a pimple has appeared  
on



on the arm after inoculation for the small pox, such as could not have arisen from a mere puncture without infectious matter ; this has gradually subsided, and the constitution remained uninfected, though exposed to the effluvia of the disease. In the venereal, how many do we find admitted into the hospitals in whom the local disease has existed long enough to commit the most formidable ravages, yet no symptoms from absorption have followed !

• That there is a period between the time the infection is received, and the diseased action shows itself, is evident in every instance. And as in most we can perceive no alteration during that interval in the actions of life, this state of the constitution has been called, by Mr. Hunter, a disposition to take on the diseased action. In the casual small-pox\* we find a space of about twelve days between the reception of the poisonous effluvia and the first symptoms of the disease. But the disposition to the disease, must have existed during that whole space, because the subject may be removed from all the means of infection from the time he first received the effluvia ; yet this will not prevent the disease from appearing at the appointed period. Travellers frequently leave the country where they received the miasma of ague long before any symptoms of it appear ; yet the disposition having been given, a removal into better air does not prevent the diseased action taking place.

• But even when the disposition is given, the action may be superseded for a time. Of this we have several instances, related by Baron Dimsdale, of persons under inoculation, in some of whom the period of eruption was protracted, and in others the pustules, after eruption, rendered stationary by the action of other diseases. These are instances where the action is suspended in morbid poisons, producing their effect by symptomatic fevers, having their stated crisis and termination. The same happens to those which affect locally, and by absorption,

Y 2

\* See Dr. Haygarth.

forption, without a crisis. The venereal never shows itself on the skin, or in the bones, whilst the first local symptoms are yielding to mercury given in any form. But the disease will appear in the skin or bones, after the first local symptoms have been removed, and the effect of mercury on the constitution has ceased. In this case the diseased action has been suspended, after the disposition had taken place. This will be at once admitted by every one who reflects, that the source of infection no longer existing since the cure of the original local complaint, the disease that afterwards appears must be in consequence of matter absorbed before the local was cured; and if its appearance is later than the stated time, it must be because the constitution was occupied by another, namely, the mercurial irritation.

‘ In the small-pox these phænomena are more obvious, because, since the introduction of inoculation, the periods of infection, fever, and eruption, have been marked with greater perspicuity, and the uniformity is more striking from those periods being short, and all the symptoms acute. But if we allow for the difference between eight days, which is the medium the inoculated small-pox requires, and six weeks, the medium of the venereal for showing the effects of absorption, we shall not find the variation in any greater proportion. For if, as the same author observes, the former varies from one to ten, or even twelve days, without any apparent constitutional impediment, the latter may be supposed to vary from one to as many weeks, and even longer, because, in proportion to the length of time, there is a greater probability of some accidental circumstance happening, to suspend or forward the action.’

It is a law with most of those morbid poisons, which produce their effect by a critical fever, that a constitution which has once gone through the action excited by them, is no longer susceptible of it. But poisons which produce diseased actions, without critical terminations, as the venereal, do not leave the constitution less susceptible of their influence, except for a time.

Besides



Besides the morbid poisons, which communicate a disease similar to the parent stock, it appears, the author observes, as if the healthy secretions of one person may, under certain circumstances, be deleterious to another. Whether any of the poisons, now frequently met with, originated from such a cause, cannot be determined; certain it is, that many of them are of recent date, which in some we ascertain with tolerable accuracy. All of them are more readily conveyed when the cuticle is removed, or is very thin. The parts where the cuticle is thinnest are, the genitals; the papillæ, and the mouth. In all these we have instances of disease implanted, which cannot be traced from the parent stock: although it has been usual to call every affection of this kind venereal, But these local affections were known to the ancients. Celsus, whose accuracy can only be exceeded by his brevity, describes no less than nine appearances of ulcer on the penis, which he distinguishes by their progress and situation. Some of these local affections have been described, as accompanied with exostosis on the scalp and tibia†, and yet were cured without mercury — a proof, in the opinion of Mr. Hunter and Mr. Adams, that they were not venereal.

Mr. Adams goes on to describe the local action of morbid poisons when applied to the body: of this he makes the following divisions:

1. *Slough*, with consequent fungus and scab, as in yaws.
2. ———, with suppuration and scab, as in small-pox.
3. ———, preceded by ulcer, and, when separated, followed by immediate skinning, as in several anomalous poisons.
4. ———, with ulceration, and each in succession, as in the sloughing phagedæna.
5. *Ulceration*, kept up by the irritation of the secreted pus, as in the common phagedæna.
6. ———, with a thickened edge and base, as in the venereal.

Y 3

After

† Hunter on the Venereal Disease, page 385.

After following Mr. Hunter in his account of the processes of ulceration and cicatrization, Mr. Adams traces the deviation from the general law, when the disease arises from the stimulus of a morbid poison: these varieties, he remarks, are reducible to laws, with an uniformity that is truly striking.

When a loss of substance is induced by the stimulus of a morbid poison, whether from slough or ulceration, as soon as the diseased action ceases, instead of granulations rising to fill up the cavity, we find it first skinned over, and, if the lost substance is restored, it is by a subsequent process under the skin. This is observed in the pustules of the small-pox, in chancres, where the ulceration has acquired any depth; and it may be traced in all the anomalous morbid poisons.

The regularity with which granulation takes place in all secondary or constitutional ulcers, is no less remarkable. This is always the case in the venereal, in the sloughing phagedæna, and in all the morbid poisons, of whose secondary symptoms we have any correct history. As this difference must convince us that the poison undergoes an alteration in the circulation, it might have led us to doubt whether the pus secreted in the secondary ulcers was infectious like that of the primary ones. Mr. Hunter has reduced this to experiment in the venereal, and shewn that the poison, in the course of the circulation, loses its infectious properties. Nothing of this kind having been attempted in the anomalous poisons, Mr. Adams only remarks those differences between their primary and secondary symptoms, which might lead us to form a similar conclusion.

When secondary ulcers are similar to primary ones, as is the case in small-pox, where the pus in each is equally infectious, granulation does not take place in either; except where skinning is prevented by the presence of slough, which appears to give rise to the granulating process, and produces fungus, which is for the most part a prelude to healthy granulations.

Having



Having considered the laws by which the parts injured are healed or restored, Mr. Adams next traces the operation of remedies, where the original powers of the constitution are unequal to the cure, or where the progress of the disease may be shortened. He first speaks of the actions induced by mercury, its manner of curing ulcers from morbid poisons, and of the diseased actions induced by its use.

If mercury be exhibited while there is a crude wound, we find it acting as a poison; that is, producing ulceration beyond what is necessary for dislodging the dead edges of a cut. If now the mercury be discontinued, the ulceration will cease, and the healing process commence. We may therefore in some instances expect, where a morbid poison keeps up phagedæna, by the pus producing a similar irritation to the one which first caused the ulcer, that by inducing the mercurial irritation, we may supersede the former by a phagedæna, which will not be permanent. The only difficulty is to determine when we have superseded the first, as by continuing the remedy too long we produce a phagedæna which may be kept up by habit: but this may be avoided by accurate attention; we should stop as soon as we are convinced, by any change in the ulcer, that the mercury has begun to excite a fresh action.

From what has been said it will appear, why mercury will be often serviceable in ulcers that do not arise from morbid poisons. From various considerations, likewise, the author infers, that less mercury will cure an ulcer, arising from a morbid poison, without a callous edge and basis, than where these are present; that mercury is frequently unsuccessful in ulcers from morbid poisons attended with slough; and that a later application of this remedy will cure an ulcer from a morbid poison, which at first resisted that remedy: that less mercury will cure the secondary than the primary affections induced by morbid poisons: and that mercury will not prevent the secondary actions of those morbid

Y 4 poisons,



poisons, which it will cure when they do appear. For this latter proposition we are indebted to Mr. Hunter.

Mr. Adams concludes, therefore, that mercury is a remedy we are justifiable in trying in all cases of ulceration, that resist common topical applications and restorative remedies, particularly if unattended with slough.

That where ulceration is unattended with a callous edge and base, mercury should be exhibited with greater caution, and the mercurial salts for the most part preferred.

That the secondary ulcers of some morbid poisons yield to less mercury than their primary ones.

That in some instances, where mercury has been freely exhibited before the appearances of secondary ulcers, it has not prevented them. Yet in these same cases, when secondary ulcers have appeared, they have yielded to a much slighter mercurial irritation than was ineffectually raised to prevent them.

That blotches or ulcers, which appear after the cure of secondary ulcers, seem in the manner in which they yield to mercury, to bear the same analogy to secondary ulcers, as secondary ones do to primary.

And lastly, that if a primary ulcer, whether of the sloughing or true phagedæna, should at first refuse to yield to mercury, we may be justifiable in attempting it a second time with great caution, either when we conceive the disease kept up by habit, or so far familiarized to the constitution, that the novelty of the mercurial stimulus may be sufficient to excite a new action, however temporary.

Besides the ill effects of mercury, when long continued, in producing phagedæna, its general ill effects on the system are well known. Hence, observes Mr. Adams, it seems to follow, that while it remains a doubt, whether mercury will prevent the secondary symptoms of a morbid poison, and as far as our knowledge extends, those secondary symptoms, when they appear, give way to a comparatively slight exhibition of the remedy, it may be safer, till the laws of such  
poisons,



poisons are better understood, to rest when we have relieved the primary symptoms; and watching attentively the access of any secondary ones, attack them as early as they can be fairly ascertained.

It may naturally be asked, if there is this variety of poisons to be traced in the account of different diseases of the genitals, and above all, if, for the most part they yield to mercury, either in their primary or secondary stages, how should the world have been so alarmed at the appearance of the venereal, which at most could be only an addition to those calamities it had always witnessed? To this Mr. Adams replies, that the venereal, as far as we can ascertain, is the only poison that produces a disease formidable, by the probable extent of its spreading, and by the situation of all the infected. In the other three, viz. the *ulcer* terminating in slough, the *sloughing* and the *common phagedæna*, the symptoms are too acute to admit coition, and as soon as they begin to subside, the parts heal rapidly. In the venereal, the actions are all slow, from the causes before enumerated, so that coition in either sex may for a time be continued after ulceration has commenced. It may also, as will hereafter be shown, produce only gonorrhœa, the discharge from which is infectious.

Secondly, the constitution has no power over the diseased action this poison occasions, nor indeed has any remedy but mercury, the use of which was unknown in Europe when the venereal first appeared.

Lastly, we have not yet ascertained, that either of the other poisons produces that uniformity which can be traced, like the venereal, from the infecter to the infected. Though chancres are precisely similar in women and men, we have no accounts transmitted of sloughing ulcers in the the vagina, so that if they occur at all, it is at most but rarely.

Having traced the poisonous effects of matter applied from one animal to another of the same class, and when under the influence of no specific disease, the author adverts to the very obscure question, concerning the  
origin

origin of diseases, which at present never appear to originate with the sufferers. It seems, he observes, very difficult to conceive how they at first sprung up. Mr. Hunter, as far as the obscurity of his language will enable us to judge, seems to conjecture, that the venereal might owe its origin to some unnatural connection. Certain it is, that diseases in one class of animals, when communicated to another, seem to alter many of their properties. It has not yet been exactly ascertained, what is the peculiar situation of the dog, or other rabid animal, when his bite produces hydrophobia. Certain it is, that the same symptoms have not uniformly appeared as those which have followed his bite. The cow-pox is a disease well known to the dairy farmers in Gloucestershire. The only appearance in the animal is a phagedænic ulcer on the teat, without any apparent inflammation. When communicated to the human, it produces, besides ulceration in the hand, a considerable tumour of the arm, with symptomatic fever, both which gradually subside. What is still more extraordinary, as far as facts have hitherto been ascertained, the person who has been infected is rendered insensible to the variolous poison.

Whether any of the morbid poisons, which at present so much diminish the period of human life, arose from such causes, it is impossible to ascertain. It would be easy to suggest many arguments that might favour such an opinion, derived from the countries from which some of these poisons are said to have originated. But as nothing satisfactory can be ascertained, it is much more to the purpose to direct our attention to the laws by which every poison is governed, till an accumulation of facts shall enable us to form rational conclusions.

The seventh chapter treats of carcinoma and other local diseases, usually called cancerous. The term, cancer, has been so ill defined, and given to such a variety of appearances, that the greatest confusion has prevailed on this subject. Hence the names of re-  
respectable



spectable practitioners have been brought in question, remedies highly important have been undervalued, and some of a stimulating property, when applied to carcinoma, have greatly exasperated the disease. To remove this ambiguity as much as possible, the author gives a description of the disease, under the general term of *carcinoma*, avoiding the names of schirrus and cancer, which have been used in too general and undefined a sense. On this subject his opinions will probably appear new to the greater part of practitioners. ‘Schirrus, or, as I would call it, the early stage of carcinoma, has usually been described as a glandular affection, and some, who have taken notice of the cysts, seem to consider them as accidental appendages to the disease. From all the observations I have been able to make, aided by the preparations I have had access to, and even all the more accurate accounts of authors, it appears to me, not only that the cyst is constantly found in cases of true carcinoma, but that it constitutes its character.’

‘In what manner or from what cause these hydatids first arise, is beyond the present state of science to determine. When they are formed, they have the property of encreasing in different degrees from causes equally beyond our knowledge. It appears, also, either that their number augments, or that some which were altogether imperceptible to the touch, and the patient’s sensation, encrease in such a degree as to equal the size of the largest. This enlargement of a foreign body in a solid substance, and so extremely sensible as the breast, cannot but be attended with intense pain and frequent inflammation. The increase of the cysts is not towards the surface, like matter in a common abscess, but in every direction. Another peculiarity in this disease is a disposition to fungate before the skin is broken. This is generally to be discovered in a certain degree in breasts that have been amputated before ulceration. But if the disease is suffered to proceed till the skin ulcerates, the usual appearance is a fungus, which being  
no



no longer confined, very soon grows, sometimes to a considerable extent beyond the lips of the ulcer. It appears as if its previous confinement gave it a hardness unusual for substances of this kind. At least I have observed, in several instances, a difference in the firmness of the fungus, where the skin has been destroyed by art or by ulceration. To this fungus we are to impute the discoloration and unequal surface of the skin, which preceded ulceration.

Such is the progress of the ulcerated carcinoma, or open cancer, as it is called, when the cysts are small and deep-seated, with a quantity of fungus between them and the surface. After ulceration has commenced, the progress is extremely uncertain, depending upon the patient's health, the situation of the cysts, their size, and often on the remedies. Sometimes the fungus will remain nearly stationary for many months, occasionally bleeding, or discharging matter of various consistence, till a large cyst, or probably several below its base, suddenly bursting, or gradually separated by ulceration, detach the whole, and expose an ill-conditioned surface, consisting partly of the tunics of the cysts. In other cases where the cysts have been nearer the surface, the fungus ulcerating or sloughing away in various parts, exposes, at different periods, several roundish *foveoli*, apparently filled with sloughs, but which are nothing more than the cysts with their contents, changed from their original appearance to that of an opaque pale, somewhat resembling half dissolved leather. When any of these are exposed, the fungus bed, in which they are deposited, seems to recede from them by ulceration, and on removing some succeeding dressing, a cleaner surface appears. If this happens near the edges of the ulcer, and no other cysts, or fragments of them remain near, the lips, which before were reflected on the sound skin, being forced back by the increasing fungus, will very soon take a different direction, and the wound will contract.

These



These are among the appearances ulcerated carcinoma assumes when the hydatids are deep seated, or small. But sometimes it happens, that one or two particularly large, or a cluster of them, extends from the surface very deep. When this is the case, very soon after the skin has separated, a considerable evacuation of fluid follows, as described by Dr. Monro\*, or a perpetual dripping, which will last till all the hydatids, exposed by the opening, are evacuated. Even then it seems doubtful whether the distillation is not kept up from the sides of the cysts, as it sometimes continues for a considerable length of time, and in great quantities. This evacuation of the cyst or cysts, very much relieves the patient, without rendering the breast at all flaccid, but producing a most ghastly cavern of an irregular surface, lined in many places with the tunics of hydatids, and emitting a very peculiar smell. In the mean while the edges, as far as they are free from hydatids, make an attempt at granulating, which produces an exuberance of fungus that reflects the skin back in such a manner that it may be almost said to curl.'

This description it is plain is confined to the disease, when situated in the breast, and is applicable, in the author's opinion, to all other cases of true carcinoma; but he cautions us against confounding, as has been too frequently done, various other phagedænic ulcers with this disease. The ulcer of the uterus, which is commonly called cancerous, is said to be seldom really so. On the whole, the author's peculiar opinions on this subject may be gathered from the following queries, which he considers as proper objects for investigation.

1. Is the simple hydatid the first form of carcinoma?
2. Is there any difference between abdominal and carcinomatous hydatids, except in the slow progress of the latter, the number of their tunics†, and the contents of some of them?

3. Are

\* Medical Essays, vol. v. page 339.

† 'The tunics and contents of carcinomatous hydatids may, I think, be explained; the first by frequent inflammation producing  
strata

3. Are carcinomatous hydatids, like those of the abdomen, divisible into such as multiply within a cyst, and such as multiply without any circumscribed cavity to confine them?

4. Does the permanent success of the operation for carcinoma depend on the hydatids being confined within one common cyst; in consequence of which, when the tumour is removed, no hydatids can be left imperceptible to the eye, but whose subsequent growth and multiplication may perpetuate the disease?

5. Where no operation is performed, is the period of the patient's existence to be estimated by the magnitude of individual hydatids, and the rapidity of their growth?

6. Have these hydatids a life independent of the subject in which they grow, excepting as parasites?

7. If so, should the means of cure, where an operation is not submitted to, be directed to the extinction of that life, with as little injury as possible to the patient's health?

8. If hydatids possess the principle of vitality during their transparent state, and their opacity is the effect of the loss of that principle, would they not, in the latter stage, stimulate the parts in which they are situated to suppuration, as we find the case with the guinea worm when dead?

9. Would not this suppuration prove the destruction of all the neighbouring hydatids? or, should carcinomatous hydatids produce absorption of the internal coat of the pylorus or cardia, as they do of the liver and spleen, so as to find their way into the cavity of the stomach, would not this be equally destructive to them?

10. May not the fungus, generated between the hydatids and the surface of the skin, or towards the cavity of the stomach, be for the purpose of preventing suppuration in one instance, and absorption in the other?

The

strata of coagulated lymph, the latter by these bodies increasing in a substance so sanguiferous as the fungus. The tunics of Fagel's incised hydatids were thin, and some of Watson's were filled with bloody lymph.'



The last chapter contains a comparative view of the theories of doctors Foart Simmons, and Swediaur, John Hunter, Messrs. Foot, Moore, and Bell, on the laws of the venereal virus; with an enquiry how far the opinions of Mr. Hunter are confirmed by facts, admitted by Boerhaave, Astruc, and other writers of reputation. The controversial nature of this part of the work prevents our entering particularly into it. We shall only observe, that the author's object appears to be, to vindicate a character which has been much abused by those who are unacquainted with his opinions: by contrasting them with those of his adversaries, to shew how much we are indebted to him for accurate observation, and how superior he stands to the herd of his opponents: a task, indeed, not difficult to any one acquainted with their comparative merits.

We shall conclude our account of this ingenious performance with the following recapitulation of Mr. Hunter's doctrine on the venereal disease.

1. That the matter which produces chancre may produce gonorrhœa only.

2. That the matter absorbed from either circulates with the blood, and is thrown out by the common excretories; but in its progress may contaminate other parts of the body, and give them a disposition to a disease different from the first.

3. That when this disposition is given, the diseased action does not follow till a certain time, which varies according to the constitution and other circumstances, but never happens while the constitution is under a mercurial irritation.

4. That when the disposition has taken place, the action may be suspended by mercury, but the disposition will remain, and the action shew itself at some period after the mercurial irritation has ceased.

5. That when the action has begun in an order of parts, it may be cured, and will not return in the part or the order of parts to which it belongs, from the same stock of infection. But

6. That

6. That the diseased action will take place in another order of parts, if that other order has been contaminated; and in this order it must be treated as in the former.

7. That when the diseased action has taken place, and been cured in the part first infected, in the throat and fauces, the skin, and the bones or periosteum, the subject may be said to be free of the disease, as far as our knowledge has hitherto traced it.

8. That the usual time of the skin or fauces taking on the diseased action is, on a medium, six weeks after the mercurial irritation that cured the first symptoms has subsided; in the bones about twice that time; but this period has varied, like other morbid poisons, and apparently in a greater proportion: but this has not hitherto been accurately ascertained, especially when we take into account the proportionate ratio in the varieties of other morbid poisons.

ART. XXVI. *A Treatise on the Diseases of Children, with general Directions for the Management of Infants from the Birth.* By MICHAEL UNDERWOOD, M. D. Licentiate in Midwifry, and Physician to the British Lying-in Hospital. — 2 vol. 12mo. pr. 10s. 6d. boards, 3d edition. — MATTHEWS, London. 1795.

**D**R. Underwood's situation in the British Lying-in Hospital must, in a particular manner, have qualified him for treating on infantile diseases. The present publication is, perhaps, the most extensive and complete which we have on the subject. Much of novelty in so general a treatise is not to be expected. The general plan of the work may be collected from the author's preface.

The encouragement which the author has met with from the public approbation of the former editions of this work, has induced him carefully to revise, as well as further enlarge this third impression. He has  
at



at the same time endeavoured to avoid all unnecessary details, and useless distinctions, as well as extending it to subjects foreign from the immediate design. Should the reader apprehend any little exceptions in this respect, he will readily perceive the inducement; and although the accuracy of system should somewhat be violated, it is presumed, it has only given way to motives of humanity and usefulness.

Perfectly sensible, however, of numerous defects, the writer relies again upon the indulgence of the public, though he hopes that, as this edition will be found more complete, it may be proportionably worthy of a continuance of that favourable reception wherewith the former have been so generally honoured. Particular acknowledgments, indeed, are due for the approbation of the faculty; and the like candour, it is hoped, will now excuse any alterations that have been intended to render the work easy and familiar to common readers. For the sake of public utility, the writer has carefully avoided all technical terms, or has so explained them, and so enlarged on the nature of diseases, and the doses of medicines, that parents and others, not versed in the practice of physic, may find all common directions sufficiently explicit: whenever they appear otherwise, readers of that description should conclude, that the case is too difficult for their management, and that probably the best guide might mislead them.

The prolixity of other parts may be equally disagreeable to professional men.—For the style in general, indeed, the author pretends to have but little to offer. Had he more leisure, possibly it might have been less incorrect; though it is hoped, that many of the greater imperfections, which appeared in former editions, are here done away. Perhaps, the necessity of clearly and intelligibly expressing what is to be said, may, in this instance, be pleaded with those who expect conciseness and accuracy; which every writer should aim at. It may therefore be observed, that some consentaneous diseases have been longer dwelt upon, and their reme-

dies oftener hinted, than might be necessary for many readers. To such, however, as are themselves obliged to superintend the health of their children, and to those who derive a happiness from contributing to that of their off-spring, there will not be much apology necessary, either for entering so fully into the *little* matters that compose the *second* part of the work, or for enlarging elsewhere on many circumstances that may appear trifling when separately considered. It was indeed, under the expectation of the work proving serviceable to them that it was originally undertaken, and to their notice and protection it is again submitted, in its improved state, with all deference and respect.

‘ Besides the addition of more than twenty diseases, not noticed before, and some improvements, it is hoped, in the arrangement and description of others, the present edition contains enlarged *directions for the Management of the nursery*, and a dissertation on the nature and properties of *human milk*, the result of various experiments, during several months; forming, as it is presumed, a suitable introduction to that part of the work.

‘ The writer cannot conclude this preface, nor introduce the present edition more properly, than by adverting to a pertinent remark made by the *Monthly Reviewers* upon the former enlarged edition of this work. And, indeed, the objection to so comprehensive a tract being addressed to parents as well as regular practitioners in physic, is so obvious, that the author has always been aware of it, and was conscious, that in some parts he was obliged to render the work somewhat exceptionable to both; and, accordingly apologized for it. He was, nevertheless, always persuaded, that such a plan would have its use; and of this, he has since had satisfactory experience. In vindication of this sentiment he is constrained to observe, without designing to offend any order of men, that he has met with practitioners, employed among the lower class of people, who need to be instructed nearly in the same mode with parents; and that in many country places there is no regular practitioner,  
within



within a reasonable distance, capable of prescribing so well for many infantile complaints, as intelligent parents may be instructed to do; (though, as it has been objected, it is impossible to make them physicians.) And the author has the happiness of knowing, by a correspondence with some ladies of rank, that many of them superintend their own children's health with that exactness and attention, and enter so justly into the causes of many of their early complaints, as to prescribe very judiciously, when absent from town; as well as afford much relief to the children of their poor neighbours, who might otherwise be far worse attended to.

‘ It is probable, however, that the intentions of this work, enlarged as it now is, might, upon the whole, be better answered by two distinct publications, (though this must be with some exceptions;) and if the author shall find leisure, in the course of the next year, he may possibly make the attempt. Should he fail of this, and any other person be disposed to take that trouble, the author, anxious to promote public utility, hereby testifies his consent.’

In the observations on the properties of human milk, the author enters into a controversy with Dr. Clarke, of Dublin; who, in the *Transactions of the Royal Irish Academy*, has related a variety of experiments on this substance, from the result of which he concluded, that human milk contained no sensible quantity of curdy matter; and that, therefore, the general idea of a prevailing acidity in the stomach of infants, separating this matter, and thus acting as a cause of most of their complaints, was not well founded. From Dr. Underwood's experiments it appears, that the human milk does really contain no inconsiderable portion of curdy or caseous matter, though its separation is attended with peculiar circumstances. He allows that neither runnets, acids, nor spirits, separate any very sensible quantity of this curd, in the space of eight and forty hours, as they constantly do in cow's milk, but that in a longer time it is afforded in evident quantity. It appears also that hu-

man milk has less tendency than other milks to run into acescency or putridity. The length of time necessary for the separation of the curd seems to have occasioned Dr. Clarke's denying its existence. In a practical view the difference of opinion on the subject does not seem very important. Although the coagulation of milk in the stomachs of infants in disease, be granted, it does not follow, that the chief attention of the practitioner should be directed to the destruction of acidity, as the means of preventing such coagulation. For the acidity itself is only an effect, arising from diseased action of the stomach, which of course would engage attention.

The existence of curdy matter in human milk has been proved by several foreign chemists, particularly M. Boysson, of *Aurillac*, in Upper Auvergnny, M. Luissio, and M. Bondt. The quantity of this will appear from the following table, containing a comparative analysis of the milk of different animals, by M. Abr. Van Stripriaan Luissio, *physician* to the late *Dauphin*, and M. Nicol. Bondt, *physician* at *Amsterdam*.

Scale 100.	Cream.	Butter.	Cheese.	Sugar.
COW'S MILK.....	$4\frac{1}{16}$	$2\frac{1}{16}$	$8\frac{1}{16}$	$3\frac{1}{16}$
WOMAN'S.....	$8\frac{1}{16}$	3	$2\frac{1}{16}$	$7\frac{5}{16}$
GOAT'S.....	$7\frac{1}{16}$	$4\frac{2}{16}$	$9\frac{1}{8}$	$4\frac{3}{8}$
ASSES'.....	$2\frac{1}{16}$	—	$3\frac{5}{16}$	$4\frac{1}{2}$
SHEEP'S.....	$11\frac{9}{16}$	$5\frac{1}{16}$	$15\frac{3}{8}$	$4\frac{3}{16}$
MARE'S.....	$0\frac{1}{16}$	—	$1\frac{5}{8}$	$9\frac{1}{16}$

ART. XXVII. *Medical Commentaries for the Year 1794*, published by A. DUNCAN, M. D. — Vol. ix. decade 2, 8vo. 444 pages. — ROBINSONS, London. 1795.

AMONGST the original publications in the present volume, the first is an ingenious dissertation on the effects of variolous infection on pregnant women, by Dr. Pearson.



Pearson. It consists of cases, interspersed with observations. The first case was of a woman (*Mary Sheers*) twenty-five years of age, who was inoculated in the beginning of the eighth month of her pregnancy, on the 7th of May. After the usual febrile symptoms, an eruption took place, in number about twelve or fourteen hundred, which went through its regular stages. On the 4th of June, the twenty-ninth day after inoculation, and the twenty-first after the attack of the eruptive fever, she was delivered of a full-grown dead child. To judge from the woman's feelings, her foetus had been dead four or five days before it was brought into the world. Hearing that this child was born with the small pox upon it, but that it had been buried two days, Dr. Pearson caused the body to be taken up, and on examination found numerous pustules on the skin, resembling, exactly, those of the small-pox, about the fourth day after the eruption in the favourable kind. With matter taken from this subject, Mr. Keate inoculated a girl of about nine years of age, who, there was not the least reason to suppose, had ever gone through the small-pox. The puncture inflamed and suppurated in the usual way, though no febrile symptoms or eruption were observed. As there was no eruption in this case, Mr. Keate inoculated the girl twice within six months afterwards, and at each time two other children with the same kind of matter on the lancet. The two latter went through the disorder in the regular way; but on the former, these inoculations had no effect. Dr. Pearson also inoculated her a third time, and equally without effect.

CASE II. *Mary Spoon*, thirty-two years of age, was inoculated on the 4th of June, when she supposed herself to be in the sixth month of pregnancy. She had a great number of pustules, but no secondary fever, and went through the stages of suppuration and desiccation, without suffering considerably, or having any unusual symptoms. This woman enjoyed good health during the rest of her pregnancy; and was delivered the beginning of October of a healthy full-grown child. It was inocu-

lated in both arms when eight weeks old. The punctures inflamed at the usual time, and the child sickened on the eighth day, but no eruption took place. On a repetition of inoculation, no inflammation followed. On these cases Dr. Pearson offers the following observations.

“ The numerous records of inoculation for the small-pox contain but little information concerning the effects of it in the advanced periods of pregnancy. And it seems highly probable, that not much would have been known of inoculation in the earlier periods of pregnancy, if the subjects had not concealed, or been ignorant of their being in this state. The opinion, that it is most dangerous to inoculate in every stage of impregnation, appears to be founded on reasoning, and extensive experience of the fatality of the natural small-pox, during the whole time of utero-gestation. But from a pretty considerable number of instances, which I can adduce, it seems that the inoculated small-pox, within the sixth month of pregnancy, is very seldom fatal to the mother, although it very frequently kills the foetus. Hence, I apprehend, the practitioner, who should not inoculate in these states of pregnancy, under the circumstance of unavoidable exposure to infection, would be deemed as unskilful, or culpably timid, as he would be accounted ignorant or rash, who should inoculate in the absence of the circumstance of present infection. On this ground, the justification of my practice, in one of the above two cases, is founded; namely, in that of Mary Spoon, who was little more than five months gone with child. And with regard to the other case, in which the woman was in the eighth month of pregnancy, although I then knew of only one instance of inoculation at so late a period, viz. a case by Mr. Quier, which terminated favourably, yet I considered the practice to be justifiable; because, in about twenty cases, to which I can refer, of the natural small-pox, under similar circumstances of pregnancy, the disease proved fatal to three-fourths or four-fifths of the women, and to a still greater proportion of the foetuses.

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These two cases, then, may serve as useful data in practice, in judging of the propriety of inoculation in the two last months of pregnancy.

“ With regard to the small-pox having taken place before birth — In one of the cases above related, the woman was delivered of a foetus, with eruptions upon it, exactly like those of that disease; and the effects of the matter of these eruptions, on a person who had not had the small-pox, afforded a strong, if not unambiguous proof, that this infectious disorder took place before birth. I remained, however, in a state of hesitation with respect to the infectious nature of the dead foetus, until I had well considered the circumstances of the case, and compared this case with those of the same kind which are on record, or have fallen under the observation of other practitioners. The evidences of a disease being the small-pox seem to be the following :

1st. “ Certain symptoms and appearances, observed only in particular stages of the disease.

2d. “ Certain symptoms, which occur in succession.

3d. “ Scars in the skin after the disease.

4th. “ The constitution not being, after the disease, susceptible of the small-pox, from the insertion of variolous matter.

5th. “ The matter of the eruptions producing the small-pox in other persons.

“ Now, as the small-pox may take place, and the peculiar symptoms, and symptoms in succession, not be present, nor scars be left, and as the other proofs are equivocal, or not in every case present, it follows, that cases may occur, in which it is impossible to determine the question at issue beyond the reach of doubt. For, even the last proof mentioned is sometimes undecisive, as I will make appear by two instances. Mr. Dawson relates, in the third volume of the Transactions of the College of London, that on the seventh or eighth day after inoculation, he took matter from the places of incision of two children, who had no observable fever or eruption; and, by inoculation of nineteen

persons with this matter, there ensued, in all of them, inflammation, eruptive fever, and, apparently, variolous pustules.

“ The two children, whose matter had infected these nineteen persons, were inoculated a second time ; when, besides the usual inflammation and suppuration of the parts of the incision, a fever came on, succeeded by seemingly the true variolous eruptions, as in the most regular small-pox. Dr. Leake has published a case, on the authority of Mr. Head, in which variolous matter applied to himself, who had certainly had the small-pox, produced inflammation and suppuration in the part inoculated ; but there was no fever or eruption. The matter however of this abscess produced, by incision, in a person who had not had the small pox, inflammation, eruptive fever, and pustules, as in the most regular small-pox. Dr. Rush mentions an instance of the same kind in the London Medical Observations and Inquiries, vol. v. page 40.

“ To remove all ambiguity, seven persons were inoculated with the patient’s matter in Mr. Head’s case, and they all had the peculiar symptoms and succession of stages as the regular small-pox.

“ If these facts had not been credited by the most judicious practitioners, because they are confirmed by their own observations, I should not have brought them forward on this occasion.

“ I return to my remarks on the case of Mary Sheers. She was delivered, as hath been stated, when eight months, and perhaps two weeks, gone with child, of a dead fœtus, covered with pustules of such an appearance, singly considered, as probably have only been seen in the small-pox ; and I am authorised to affirm, with confidence, that such pustules, in such a number, have been seen in no disease, but that which they exactly resembled, namely, the small-pox. Strong confirmation that these were variolous pustules, is afforded by the circumstance of the mother having had the small-pox at such a period, before parturition, as to  
have



have infected the foetus, and for the disease in it to have made the progress manifested by the appearances on its body; assuming, however, that the stages and periods of the small-pox are the same in the womb, as in the natural way in the air.

“ The variolous nature of these eruptions, in the dead child, is farther proved by analogous cases; for such pustules, and in such a number, have been seen on the birth of the foetus *only*, in those cases where, like the present, the mother had a short time before certainly had the small-pox.

“ Farther evidence is afforded, by the inoculation with the matter of this dead child. And, if the effects were not such as to remove all ambiguity, there having been no observable fever or eruption, they were at least such as to yield a strong confirmation of other proofs.

“ Supposing the foetus, in this case, to have had the small-pox before its birth, and that the progress of it was as in the natural way, the child could not have been infected by the matter with which the mother was inoculated, but might by the infection generated by the constitution of the mother. It does not seem unreasonable, or inconsistent, to calculate, that the foetus was infected on the first day of the eruptive fever of the mother, which was the eighth day after inoculation; that in ten days farther, its whole constitution was affected by the eruptive fever; that during two days more, the eruptions came out; and that it lived four days after the first appearance of the eruptions. The child, therefore, probably died on the sixth day after its constitutional affection, and the twenty-sixth day after the inoculation of its mother, which was the 31st day of May, or 1st of June; and after remaining four days dead in the womb, it was brought into the world in the condition above described.

“ Although, in the case of Mary Spoon's child, we had not the decisive and unequivocal proof of the constitution being infected, from the appearance of variolous eruptions, the other proofs leave very little doubt that

that the small-pox was really produced by the first inoculation; for inflammation ensued, in the usual manner and time, as in the small-pox, and tumour and suppuration followed, by scars in the inoculated parts, as well as febrile symptoms, probably on the eighth day. This succession very rarely, or perhaps never, happens, except in the small-pox, whether eruptions be present or not. But our doubts are almost all removed, by the variolous matter being applied twice afterwards, without producing any effects. We may add, as a farther proof, that there is not on record, a single well authenticated case of the small-pox taking place in the uterus in the sixth month of pregnancy."

Dr. Pearson, in the next place, gives a brief statement, with some remarks, of the cases which are recorded, and which have fallen under the observation of his medical friends, as instances of the infection of the unborn foetus with variolous matter. Twenty-two cases of this sort are here brought forwards. From the very small number of instances, observes Dr. Pearson, in which the foetus in the womb appears to have been infected, among the great number of pregnant women affected with the small-pox, we may safely conclude, that this disease, in such cases, very rarely extends to the foetus. The proofs of the fact upon which this conclusion is founded, are from the children of such women having the small-pox after birth; and from the absence of eruptions constantly before the seventh month of pregnancy; and generally, in premature births, at a later period. From the very small proportion of persons, who are not supposed to be susceptible of the action of the variolous matter, although their mothers, while pregnant, who had already passed through the small-pox, were exposed to the influence of this poison, and from their not being a single satisfactory proof of this disease in the womb of such women, it may reasonably be doubted, whether the small-pox ever takes place in the uterus, except from infection, generated by the mother.



In all the above cases of the supposed small-pox in the womb, in which the disease appears to have been communicated by the mother's infectious matter, the time of the action of the matter in the foetus may have been the same as in the natural small-pox in the air; which may reasonably be supposed to be the case: because, under both circumstances, the variolous poison is probably conveyed into the constitution along with the aliment; whether that be *oxygen*, which enters by the way of the lungs; or *animal and vegetable matter*, which enters by the way of the alimentary canal.

It appears, from the above cases, and others on record, that the natural small-pox, in pregnant women, is fatal in at least nineteen out of twenty cases to the foetus in the womb, and to three-fourths, or four-fifths of the women. Nor is there, perhaps, a single decisive instance of a patient going through the disease in the womb, and being afterwards born alive. It is not even clearly proved that a child, born with the small-pox, has survived this disease.

On what circumstances this fatality to the foetus depends, we know not, but it is obvious to suspect three: *viz.* 1. The foetus being immersed in liquid. 2. The small quantity of oxygen taken into its constitution, and that only through the intervention of the mother. 3. The temperature of the surrounding medium of fluids and solids being  $97^{\circ}$  or  $98^{\circ}$ .

It is particularly worthy of notice, that the foetus in the womb dies with a smaller number of eruptions upon it, than scarcely ever happens from this disease after birth.

There are some facts to shew, that it is probable, a very small proportion of pregnant women die by inoculation, although the foetus generally is destroyed. All calculation is liable to much inaccuracy in the present state of facts; but in about forty cases of pregnant women, inoculated in almost every stage of pregnancy, which I could state on the authority of Sir George Baker, Baron Dimisdale, Dr. Ingenhous, Dr. Woodville, Mr. Wackfel, and from the above cases,  
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one died, as stated by Sir George Baker, to have happened in the sixth month of pregnancy ; but not one in a hundred dies at earlier periods of pregnancy than seven months.

There is no reason to suppose, that the mother's constitution is at all disordered by the small-pox of her foetus, although premature labour and parturition are very liable to come on during the disease of the mother.

It appears, from the above cases, that the disease in the mother and foetus is not always in the same degree : for that, in some cases, the mother has the disease severely, and very numerous eruptions, but the foetus has a small number of eruptions. And, on the contrary, at other times, the mother has the disease slightly, and few eruptions ; but the foetus a great number of pustules.

If it be allowed, that the above statement of instances of small-pox in the womb, establish the fact, that the foetus is not infected by the variolous matter that infects the mother, and that the foetus is never infected but by variolous matter, generated by the mother, it seems highly probable that this fact will be frequently referred to in physiological and pathological reasoning.

II. The second observation is, *A cancer-like Case of the Uterus, cured by a Course of mercurial antimonial Pills.* By Mr. ROBERT BISHOPRICK, *Surgeon, York.* — In this case all the symptoms were present, which are usually thought to characterise the cancer of the uterus. A foetid, sanious discharge, with burning, gnawing pains ; and, on examination, a schirrous induration, and enlargement of the os tincæ and some part of the womb adjoining. A pill, composed of one grain of calomel and sulph. aurat. antimon. was ordered twice a day, and continued for twenty weeks in all ; during which time the gums were kept sore, and she sometimes salivated a good deal. The symptoms gradually disappeared.

III. *An Account of the Effects of an over-dose of the Terra Ponderosa Muriata.* By Mr. A. MATHER, *Surgeon.* — The



— The quantity of the medicine taken was conjectured to have been about seventy or eighty drops. Purging first, and then vomiting ensued, and a general relaxation of the limbs took place, so that the patient could not produce the least possible motion in any joint or limb. The extremities felt deadly cold. In twenty-hours these symptoms went entirely off.

IV. *An Account of the Effects of Compression by the Tourniquet, in stopping the cold Fit of Intermittents.* By Mr. GEORGE KELLY, Surgeon. — Several instances are here related of this curious fact. The instrument was applied on one thigh, and on the arm of the opposite side, at the same time. In two minutes after its application, the shivering, and other symptoms of the cold stage, entirely ceased; a mild hot stage was immediately induced, and the patient found himself quite relieved. The tourniquets, after remaining on fifteen minutes, were removed, when the cold symptoms did not return. The author concludes, from the whole of the trials he has had an opportunity of making, 1. That at any time, *during the cold fit* of an intermittent, if tourniquets be so applied as to obstruct the circulation in two of the extremities, in three minutes thereafter the hot stage will be induced. 2. That if the tourniquets be applied *previous* to the accession of the paroxysm, the cold stage will be entirely prevented. 3. That where the cold stage of an ague is either thus shortened, or altogether prevented, the following hot stage is rendered both milder and shorter in its duration.

The effects observed to take place in health were as follows: 1. Great increase in the velocity of the circulation, as judged from the pulsation of the heart and arteries. 2. Increase of heat, and flushing of the face. 3. Anxiety, and more frequent respiration. 4. The tourniquets being kept on more than six minutes induce a tendency to syncope. 5. Being removed, and the circulation restored, the velocity of the circulation soon falls to its natural standard, and frequently below that.

V. *Observations on the Kuritsba Slepota, or the Hen-Blindness of Russia.* — We have already noticed this  
paper

paper in our Review of the fourth volume of *Memoirs of the Medical Society*\*.

VI. *Account of the Arabian Mode of curing fractured Limbs.* By Mr. EATON, formerly Consul at Bassora. — The Orientals, Mr. Eaton observes, will never consent to have a limb cut off. Their practice is, to lay the limb on an oiled mat, after reducing the bones, and then inclose it in a case of gypsum or plaster of Paris; an operation they perform much in the same way as is practised by statuaries, to take a cast of a limb. They first pour the Paris plaster under the limb, till it rises to such a height as to touch the whole lower surface, filling up all inequalities, so as to form a sort of bed; placing at the same time a few hollow reeds at proper distances, and in such position, as to serve to conduct away, through the plaster, any fluid that might collect in the gypsum case, from the wounds, &c.

When this becomes firm, which it does in a very short time, the limb is next covered with the same Paris plaster, so as to inclose it completely; and, on hardening, to form a light case or plaster boot, to keep the parts in as natural a position as possible. They next make a sort of furrow or channel in the soft plaster, on the upper surface, to receive such vulnerary fluids, during the treatment, as they think conducive to the cure, and which filter through the gypsum, to humect the leg at pleasure. To render this upper shell more easily removed or changed during the cure, if necessary to examine the state of the parts, &c. they make deep incisions into the soft plaster, both lengthwise and across, though not quite through; by means of which the upper case is removed without disarranging the limb. The firmness of the lower part or bed makes transporting the whole boot practicable, should such a measure at time be found expedient.

VII. *History of a Case, with many anomalous Symptoms, apparently arising from Bile, successfully treated with Mercury.* By Dr. OLIVER MARTYN, Physician, at Galway.

VIII. *Account*

\* Vide Medical Review, vol. i. page 449.



VIII. *Account of the pernicious Effects from an Impregnation given to Water by Lead.* ANON. — The water, by drinking of which several persons were attacked by the colica pictonum, had acquired an impregnation of this mineral by standing in a leaden cistern for about three weeks.

IX. *Account of a singular Case in Midwifery.* By Mr. WILLIAM RAIT, Surgeon, in Dundee.

X. *History of a Case of Puer Cœruleatus, which was observed at Glasgow.* By WILLIAM NEVIN. — In this case, after death there was observed a preternatural conformation of the heart. On opening the thorax, and cutting through the pericardium, the heart appeared much larger than usual, and the coronary veins remarkably turgid. The aorta, at its origin, was considerably enlarged; and on laying open the different cavities of the heart, it was found, that the aorta arose equally from the anterior and posterior ventricles, and that a finger could readily be introduced into it from each: the semilunar valves were found; but those of the pulmonary artery, which was remarkably contracted in its size, were firmly attached, by their apices, to the internal coat of the artery, and felt at their bases, as if in some degree ossified. The ductus arteriosus was closed. The foramen ovale was open, and admitted a large probe. The anterior ventricle was considerably enlarged in its capacity. The carotid and subclavian arteries arose by separate trunks, on each side, from the arch of the aorta.

The effects of this alteration of structure were a change of colour in the skin every where; the skin of the lips, tongue, fauces, fingers, toes, præputium, and glans penis, was died of a deep purple or claret colour, and the body felt to the hand perfectly cold. These symptoms, however, were not constant, but returned at different periods, accompanied with violent spasmodic affections of the breast.

XI. *Account of a singular periodical Discharge of Blood from the Urethra, terminating successfully.* By Mr. CHARLES STEWART;

STEWART, Surgeon, at Archangel. — A tonic plan of treatment was adopted in this case with success.

XII. *Account of the Effects of a Solution of Arsenic, in the Cure of remittent Fever.* By Dr. THOMAS FOWLER, of York. — When Dr. Fowler published the Medical Reports of the effects of arsenic in the cure of agues, the examples of its success, in the treatment of remittents (which he considers only as a modification of the intermittent fever) were not so numerous as he wished. In a letter to Dr. Duncan, therefore, he gives the following account of the effects of the solution in his own case, as an example of its success in the treatment of the remitting fever.

“ In August, 1786, I was cured of a remittent fever, with the quotidian type, of *nine days continuance*, by taking eight drops of the mineral solution three times a day, for five days.

“ In July, 1790, I was likewise cured of a remittent fever, with the same type, of a fortnight's continuance, by taking eight drops of the mineral solution twice a day, for four days.

“ In the latter end of August, 1790, I was cured of the same fever and type, of four days continuance, by taking ten drops of the mineral solution twice a day for five days.

“ In January, 1791, I was cured of the same fever and type, of two days continuance, by taking about ten drops of the mineral solution twice a day, for four days.

“ About the middle of July, 1786, when forty-nine years of age, I was seized with a slow fever, for which I took medicines, and made a considerable progress in recovery before the end of the same month.

“ On the 9th of August following, whilst recovering from the febrile debility, I was seized with a strongly marked remittent fever, for which I took twelve half dram doses of the powder of the red Peruvian bark; but the stomach and bowels being much disturbed with the medicines, and the fever still continuing, I discontinued  
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the bark, and began to take the mineral solution; which was attended with the desired effects, and was repeated, in the subsequent attacks, with the success which has been described.

“ The medicine sat perfectly well on the stomach, and had no other operative effects than that of gently opening the body, the same as if a little manna had been taken for that purpose.

“ The febrile exacerbations were always abated, either on the first or second day of every course of the medicine; when the appetite began to return, and by the time each course was finished the febrile symptoms were entirely gone.

“ I am doubtful whether the fever in August, 1790, ought to be considered as a relapse, or as a distinct attack; only eight doses of the solution, of eight drops each, being taken in the space of four days, in the preceding fever of July; which was a less quantity of the medicine than had been given in the other three courses. The curative effects, however, of the medicine, during each period of its administration, were certainly very pointed, and finally successful.”

XIII. *History of a tetanic Affection, terminating favourably.* By Mr. WILLIAM ELLIS, Surgeon. This affection arose in a negro girl, from a splinter running into the foot. Scarification and caustic were made use of to the wound, together with the use of the warm bath. No internal medicines could be used, at least so as to produce any effect. The affection lasted but a few hours.

Under the head of Medical News, we have an account, by Dr. Chisholm of Grenada, of a very extraordinary vegetable, indigenous in the Dutch colony of Demerary, which seems to possess singular efficacy in inflammation of the eyes. The inhabitants of this part are remarkably subject to the ophthalmia membranarum. The cure of this disease among the Indians is astonishingly simple. The plant used for this purpose, is named by the Indians, *akuferunee*, but by the European settlers

the eye-root. The juice of this root is so essential in curing inflammations of the eyes, that a single drop is sufficient to give immediate relief in the most obstinate cases; and at the end of four days, or by the application of four drops, the cure is generally completed. The Indians use it in the following manner. After stripping off the outer rind or bark of the root, and drawing out the woody fibre, which runs through the middle of it, they press the juice of the remaining pulpy part on a flock of cotton, which, when saturated with it, will serve several times. The remedy being thus prepared, they take a smooth green leaf, generally of the plant itself, and forming it into a kind of funnel, they introduce its spout between the eye-lids, and gently press the cotton, so that only one drop may enter the eye.

Dr. Chisholm had afterwards himself an opportunity of observing its efficacy on two patients. The roots he had procured being dry, he was obliged to content himself with a very strong infusion of what had been the pulpy part, in boiling water. By means of a leaf funnel, he introduced a few drops of the infusion into each eye every morning for six days successively. At the end of that time, the inflammation was almost completely removed; and on the tenth day the cure was perfect. These cases had before resisted every kind of treatment. A very singular circumstance, said to attend the application of this juice is, that when the drop touches the eye, a sweetish bitter taste is instantly perceived on the tongue by the patient. The infusion, however, did not produce this effect.

The plant appears to be a new species of the bignonia, to which Dr. Chisholm gives the specific name *opthalmica*. The following botanical description has been furnished by Mr. Anderson.

“ *Bignonia Ophthalmica*. *Syn.* Eye-root, or vine, Akuserunee. Wanfameey. *Foliis conjugatis cirrhosis: foliolis ovato-cordatis, integerrimis venosis, glabris, acuminatis, et punctatis. Floribus axillaribus spicatis, secundis. Siliqua liniaris longissima glabra acuminata, marginibus*



marginibus punctatis. Frutex est, radices crassæ, lignosæ, cortice fungosa. Rami scandentes, glabri, teretes subvillosi. Folia omnia conjugata, figura cordato-ovata, lævia, venosa, glabra, ad apicem attenuata, cum acumine, subtus punctis atris adspersa. Petioli oppositi teretes, deinde brachiati, partiales, teretes, et fulcati. Cirrhus axillaris apice tripartito. Flores ex axillis foliorum, in spicas longas digesti, pedunculi oppositi uniflori, ad basin bractæis tribus, minimis, subulatis. Calyx campanulatus laxus. Corolla campanulata, fulcata, secunda, putans, colore purpureo albo. Siliqua gracilis, longissima, et glaberrima, lutea, cum acumine, marginibus utrinque punctatis."

ART. XVIII. *A short Treatise on canine Madness, particularly the Bite of mad Dogs; some Cautions to prevent the Danger, and Remedies for Injuries received thereby: Together with those of other enraged Animals.* By a PHYSICIAN. — Octavo, 50 pages, price 1s. — KEARSLEY, London.

WHOEVER the physician be that has written the present performance, he has at least given a striking proof of his prudence in withholding his name from the public. It is for the most part a compilation of the worst parts of several old authors, who have written on the subject. Not that we deny the author's claim to originality. Many passages, and those not the least absurd, appear to be altogether his own. 'Hydrophobia,' we are told, 'is no part of the delirium with which persons afflicted with the above disorder is liable; but from persons in high fevers, not being able to swallow liquids without much pain; which in time so much increases, that they dread the appearance of water, &c. especially when impressed upon them. The fever being of a nervous or spasmodic kind, all the nerves are drawn into cramps; particularly the muscles, employed in deglutition, are convulsed,

‘vulsed,’ &c. &c. Immediately after we are told, that though authors differ in their description of symptoms, ‘the main symptom they all agree in; that is, what they call the hydrophobia, or dread of water.’

To shew the author’s extensive reading, we have quotations from Galen, Cœlius Aurelianus, Mead, Baccius, the Philosophical Transactions, the London Pharmacopœia, Celsus, Van Helmot, Willis, Boerhaave, the Acts of the Apostles, Leviticus, Pausanias, &c. &c. But it would be trifling with the reader to waste further time in our account of this performance.

ART. XIX. S. TH. SOEMMERING. *De Corporis Humani Fabrica.* — Vol. i. and ii. 553 pages, 8vo. 9s. — Imported by BOOSEY, London. 1795.

THIS is part of a general system of anatomy and physiology, translated from the German into the Latin language, under the inspection of the author. The first volume contains the osteology; the second, the syndesmology, or doctrine of the ligaments. The discoveries of the modern anatomists, in different parts of the human frame, rendered it necessary, in the author’s opinion, to give a new compendious system of anatomy, adapted to the present state of the science. The general nature of the present work is pointed out in the preface. The author has omitted giving names to parts, from their supposed discoverers, and that, we think, for good reasons. Various instances, he observes, might be adduced, of parts which have given immortality to some authors, having been neither first discovered by them, nor truly delineated. Does not HAVERS himself confess that the glands of the joints which have taken his name, were previously known to COWPER? Was not the valve of the cœcum known to Fallopius, long before the name of Bauhin was given to it? Has not Haller given a far more exact description of the valve of the vena cava, than Eustachius?

Has



Has not Haller given the best delineation of the valve of the cœcum? History shews us, that the greatest injustice has been exercised towards the authors of the most exact descriptions, and the most acute physiologists: to how many parts, otherwise, would not the names of Galen, Haller, and Albinus, be given?

In a compendious work, the author observes, every thing that is not essential to the study should be avoided. In comparing the larger physiological work of Haller, with his smaller, on the subject of the liver, it will appear, that every thing which is essential on the matter is more fully given in the latter than in the former.

No plates accompany the present work. In his references, however, to the plates of others, he cites only the best, rejecting those which are valued merely on account of their age, rarity, or other unimportant reason. Thus he has passed by the tables of *Vesalius* and *Eustachius*, though deservedly esteemed in their time; because we have the subjects delineated in an incomparably better manner, in those of Santorinus, Albinus, Haller, Walter, and others.

Metaphorical language, he observes, has been too much dealt in by the older writers on anatomy: *Tunica villosa*; *nates cerebri*; *pars petrosa ossis temporum*; *hemisphaerium*; *crista galli*; *alæ vespertilionum*; *cisterna chyli*; *pons cerebelli*; *dura mater*; *vena hæmorrhoidæ*, *pes anserinus*, &c. are sufficient proofs of the truth of this remark. These denominations, indeed, might be admitted, if they had always a relation to the human body. But on comparing the internal tunic of the intestines in a dog, with the same in man, it will immediately appear that the term, *villous*, has been borrowed from the former, and applied to the latter, in opposition to the true appearance of this part in the human body. Again, on a comparison of the *corpora quadrigemina* in the brain of a calf, with the same part in man, we directly see, that the term *nates* has been improperly transferred from the calf to the human body. The term, *pars petrosa* is only applicable to the skull of the

calf or other brute. The *rete mirabile* of Ruysch was a very different set of arteries from those which are called in ruminant animals *rete mirabile duplex*; for nothing of this kind can be discovered in the human body. In giving the synonima, therefore, the author has carefully selected those terms which are at once the most simple and apt; rejecting such ridiculous and obscure denominations as could serve only to excite erroneous ideas of the structure of parts.

In describing the bones, he has chiefly followed Albinus, comparing him, however, with other writers, ancient and modern. On the subject of the teeth, he has taken Mr. Hunter for his guide; on the ligaments, Weitbrecht; and Albinus on the muscles; correcting, from his own observations, and those of others, such parts of the description as appeared to be erroneous.

On the *bursæ mucosæ* he has chiefly followed Monro, without, however, overlooking the works of Janck, Fourcroy, and Koch. On the blood vessels he has followed Haller, Mayer, Murray, and Walter. The description of the absorbent system has been taken principally from Mascagnus, collating it, however, with the works of Hunter, Monro, Meckel, Walter, Hewson, &c. &c. on the same subject.

Having given a general idea of the work, the author points out such improvements as he conceives due to himself. In the *osteology*, he mentions his discovery, that the vitreous substance of the teeth consists not only of radiated, but of circular fibres also — that the teeth are changed by their particles being softened and absorbed — that the use of the marrow consists in affording a diminution of weight to the bones — that there is a canal, hitherto undescribed, in the vestibule, formed like the other parts of the labyrinth — that the sutures of the cranium correspond with the cartilages placed between the diaphyses and epiphyses of the cylindrical bones, and that they have their growth in the same way — that the earth of bones is soluble in human milk which has become acid, and that this acescency may become a cause  
of



of the bones being softened — that bones being soaked in acids, and afterwards washed, putrefy in water — that the skeleton of the negro differs materially from the European — that the cranium of a woman is considerably larger and heavier, with respect to the skeleton, than that of a man — that the spine, both intire and in its separate parts, differs according to the sex, and its relation with the sternum and other bones — that the osseous substance is in smaller proportion in all the long bones in women than in men — that the edges of a broken or divided bone become softened, absorbed, and smooth; and that they are united by means of the effused coagulable lymph becoming vascular, and at length converted into bone — that a luxuriant callus, as it is called, has no existence — that the regeneration of an entire bone does not take place in the human body, unless in very rare, and those doubtful instances:

On the subject of *ligaments* he claims, as discoveries of his own: that the small bones of the ear are united to each other by articular capsules — that the mucous ligaments, as they are called, serve for the transmission of vessels to and from the ligaments — that the spaces between bones are filled up with tendinous fibres, to prevent attrition:

In the *myology*: that the substance of the muscular fibre differs totally from that of tendons, and that these are united to muscles by agglutination merely — that tendons, therefore, are only the ligaments of muscles — that in no part of the body can muscular fibres be found between two absolute fixed points — that the muscular fibres of the heart are furnished with very small branches of nerves:

In the doctrine of the *bursæ mucosæ*: that these are found not only in the limbs, but likewise in the head and trunk of the body:

In the *brain*: that the medulla, of all the viscera, is furnished with the fewest blood vessels — that the nerves, coming from any part of the brain, being destroyed, that part becomes changed in its appearance — that the

human brain is larger, in comparison with the nerves only, and not in any other respect, than that of other animals; and that hence may be deduced the reason why man possesses rational faculties exclusively: that the spiral marrow cannot be properly called the largest nerve of the body:

In the doctrine of the *nerves*: that the nervous cords, in their progress, become manifestly enlarged, and form true cones, the *apices* of which are towards the brain, the *bases* towards the surface of the body, and that they are in no respect cylindrical — that nerves, when stretched, lose their spiral form — that the pain of cicatrices admits of a ready explanation from the pressure of nerves — that the olfactory nerve consists of a lamina of the medulla — that this nerve is the largest in the embryo, and then appears to be hollow — that the optic nerves really decussate each other; that the origin of the third pair of nerves is the dark-coloured part of the *crura cerebri* — that the fourth pair of nerves is sometimes evidently joined by a small branch to the ophthalmic branch of the fifth pair — that the lesser portion of the fifth pair goes to the third branch of the same pair — that the *nervus accessorius* perforates the dura mater in a singular manner — that the sympathetic nerve is a nerve belonging only to the blood vessels, and especially the arteries:

In the doctrine of the *arteries*: that the trunks of the arteries are always placed in the flexure of joints, and for this reason cannot have their cavities obliterated by any motion of the body:

In the *absorbent system*: that the glands are composed, some of *cryptæ*, some of convoluted vessels, and some of both these — that the absorbent vessels are larger in fat men than in the emaciated — that part of the lymphatic vessels of the *mamma* are received by the absorbents situated on each side of the sternum — that the lymph in man is coagulable by the admixture of corrosive sublimate.



On the *viscera*: that the excretory duct of the pancreas is in some degree valvular — that the minute vessel of the epididymis, which has been said to carry the semen into the veins, is shut at its extremity — that all the spermatic vessels of the testis may be filled by quicksilver:

On the *skin*: that the *rete mucosum* or *malpighianum* is a continuous membrane, at least this may be demonstrated in the scrotum of the negro:

On the *organs of sense*: that in the true center of expansion of the optic nerve, commonly called the *retina*, there are a yellowish point and small aperture.

These, with some others, are points which the author claims as his own discoveries; the priority of some of which, however, will probably be disputed with him.

ART. XX. WENCESLAI TRNKA DE KRZOWITZ, Med. Doct. Prax. Med. Profess. &c. *Historia Hæmorrhoidum omnis ævi Observata Medica Continens.* — Vol. i. 256 pages. Vindobonæ. Imported by BOOSEY, London, 1795, price 7s.

THIS is a posthumous work, published by M. Schraud, Professor of the Institutes of Medicine, at the university of Pest, in Hungary. The original manuscript was lodged, by desire of the author, after his death, in the library of the university of that place. He was induced, he observes, to undertake the present publication, from a consideration of the frequency and violence of the symptoms which take place in hæmorrhoidal affections, and the great variety of appearances which this disease occasionally puts on. Various doctrines, he remarks, have been held on this subject. Some, considering it as a disease of the first magnitude, have argued for its suppression at the first attack; whilst others, considering them as very frequently critical, and affording a solution of various other diseases, contend, that they should always be encouraged and promoted.

noted. Very few, it is presumed, have been able to ascertain the proper limits of each of these opinions.

The chief of those who have held the latter doctrine was Stahl, and he has been followed by Juncker, Albert, and the rest of his disciples. In this, however, he has been warmly opposed, especially by M. De Haen, who charges him with introducing a monstrous doctrine, destructive of human life; as considering almost every affection of the human body as symptoms of hæmorrhoids; and improperly soliciting their eruption as a means of cure. Professor Trnka, however, repels this charge, by quotations from the works of Stahl, which shew him to have been aware of the inconveniences and occasional danger of hæmorrhoidal affections, and to have cautioned us against promoting them in cases where we can have recourse, with effect, to other means.

For the purpose of reconciling these jarring sentiments, and to enable us to attain just ideas on the subject, Professor Trnka has brought forwards whatever has been heretofore written on this affection. In doing this he has undoubtedly exercised much labour and learned application. The work evinces, indeed, the profound erudition of the author, and is undoubtedly highly estimable, as bringing the whole of the subject into one clear point of view. At the same time, as containing no matter which is new, we shall not be expected to enter more fully into its contents.

The second volume, which contains the history of the *hæmorrhoides vesicæ*, has not yet come to our hands.

ART. XXI. ROBERTI TOWNSON. *Observationes Physiologicæ de Amphibiis, pars prima de Respiratione. Accedit Tabula Aenea.* — 4to. 26 pages, Gottingen, 1794. Imported by BOOSEY, London, price 3s.

THE utility of comparative anatomy, in prosecuting physiological studies, is too obvious to need particular proof. The important function of respiration receives



ceives much elucidation from a comparison of the manner in which it is performed in man, with that of other animals. This function, indeed, has at all times called forth the attention of philosophical inquirers; amongst whom, however, considerable difference of opinion has constantly existed. The question has not been, whether respiration were necessary or no; this was too obvious to admit of doubt: but the argument has been, why is respiration necessary, what are its effects in the animal œconomy, and in what manner is this function performed. Much idle speculation has been employed on the subject; but it has at least had the good effect of promoting a more minute investigation of the organs concerned, and brought us nearer to truth, by overturning errors founded in ignorance of natural facts.

The organs of respiration, and their general actions, in warm-blooded animals, are sufficiently understood. Some differences, in the exercise of this function, in the warm and cold-blooded animals, have, however, been noticed from the time of Aristotle. Speaking of theameleon, he says, “*Diffectus hic totus spirare diu potest*” — the same observation has been made by Malpighi, Roessel, and others, in frogs, Coiter and Varnier in the tortoise, and by others in serpents. Indeed, it is a well-known fact, that the lungs of amphibious animals do not collapse on laying open the thorax, as is the case of animals of warm blood; hence a material difference between those two species. From this we must naturally infer a difference in the instruments of this important function.

It appears, from the observations of Haller, and various other physiologists, that the amphibia have no diaphragm, or at least, that it is not endued with muscular powers. Besides this, the frog, and that sort of lizard, to which Linnæus gives the name of salamander, are destitute of that bony fabric, and the muscles, which in warm-blooded animals are essentially necessary to respiration. It is certain, however, that the amphibia do respire, although the instruments of this function, in them, have not hitherto been understood.

This

This ignorance has been the occasion of various opinions, repugnant to all sound physiology. Duverney and Tauwry, for instance, believed that the tortoise breathed only when in motion; and Varnier affirms, confidently, that the lungs in this animal contracted and dilated themselves, by a peculiar muscular power, resident in those organs. Haller held an opinion somewhat similar. The celebrated physiologist, Blumenbach, in a late work, attributes the act of respiration, in the amphibia, to a certain power in the lungs, which he calls the *vita propria*; a power, Mr. Townson observes, pretty like the *vis occulta* of the ancients; and tends as much to the explanation of the phenomena, as the doctrine of *Nature abhorring a vacuum*.

A knowledge of the true structure of these animals at once solves the difficulty\*. In the warm-blooded animals, inspiration is performed by the elevation of the ribs and the contraction of the diaphragm, forming a vacuum in the chest, which is filled by the expansion of the lungs, by the weight of the external air. No structure of this kind existing in the amphibia, the question is, how is this defect supplied? There may be observed in frogs, both sleeping and waking, unless when immersed in water, a remarkable motion of the throat. This motion is the action of inspiration, or at least subservient thereto, and may be thus explained:

By the same natural instinct, by which animals of warm blood are instigated to dilate the thorax, frogs are led to dilate the throat, which is filled by air from the nostrils. The air being received into the throat, the nostrils are shut by a muscular power, the glottis is opened, and the cavity of the throat again lessened by the

\* The author, whilst engaged in this subject, accidentally met with the *Synopsis Reptilium* of Laurentius, where he met with the following passage; describing the frog, he says, "Pulmone instructa, sine diaphragmate et fere sine costis, at vicaria gula, quæ alternatim aerem haurit et contracta in pulmonem propellit." Notwithstanding this work has been quoted by all succeeding writers, no notice is taken of this passage, which explains clearly the manner in which respiration is carried on in this animal.



the action of the muscles situated on this part. By this the air is impelled through the glottis into the lungs, and in this manner inspiration is performed.

When the lungs were laid bare, and the animal debilitated and exhausted by the loss of blood, although the mouth was opened for the purpose of taking in a greater quantity of air, the lungs were not inflated until the throat was contracted, and then they immediately began to expand. When a pipe was inserted into the glottis, and kept there, the lungs continued in a state of collapse; but the tube being removed, respiration again took place. The simple contractility, or elasticity, of the lungs, is sufficient to perform the act of expiration.

From observing that these animals sustain life without breathing longer than others, some have said that they breathe more slowly. This, however, does not appear to be true, although asserted by Haller, and other celebrated physiologists. On the contrary, in frogs the author has observed respiration to be more frequent than in man. The lungs, therefore, in the amphibia, must be supposed to perform the same purpose in the animal œconomy, as in animals of warm blood: the difference between the classes is, that in the former, the air is driven into the lungs by the contraction of the muscles of the throat; whilst, in the latter, it is imbibed by the dilation of the cavity of the chest.

The truth of the principles, above stated, is confirmed by the dissection of the frog, which is here subjoined, illustrated by a drawing. It is the author's intention to prosecute his enquiries on this subject: by treating, at a future time, of the respiration of the other amphibia; and, lastly, of the other singularities in the structure and functions of this class of animals.

ART. XXI. *Philosophical Transactions of the Royal Society of London.* — Part I. For the year 1795.

THE present volume of *Transactions* contains, amongst many other philosophical papers, two dissertations on muscular motion, by Mr. Home; and two on the reproduction of nerves, by Mr. Cruikshank and Dr. Haighton.—Of each of these, as belonging to the province of medicine, we shall give an account.

The first paper on muscular motion was read to the society in the year 1790, and formed the subject of the Croonian lecture. This lecture was continued for many years by the late Mr. Hunter, from whom Mr. Home acknowledges himself to have derived much of his new materials. The great difficulty and importance of the subject requires every discussion of it to be full and elaborate. Instead, therefore, of attempting an abridgement of the present essay, a task difficult in the execution, and which would probably involve the subject in obscurity, we prefer giving it in the words of the author.

‘The principle of action in an animal,’ he observes, ‘appears to be as extensive as life itself, and is almost the only criterion by which we can distinguish living matter from dead. This action does not seem to depend so much upon structure, as upon a property connected with life, which is equally extensive in its principle, and so far as we are yet acquainted, equally concealed from the researches of human sagacity.’

‘To acquire a sufficiently enlarged notion of this principle, we must not confine our inquiries to one set of animals, but must take into our view the whole chain of animated beings; and from a review of the different circumstances in which it occurs, and the varied structure of parts upon which it is impressed, we shall have sufficient evidence that the fasciculated fibrous structure commonly met with is not necessary to its existence, but only made use of for its support, and continuance.’

‘The



‘ The structure which produces muscular action, varies so much in different animals, that we are at a loss to conceive how the effects should have the least similarity; and it is, in some cases, only from witnessing the action, that we can consider the parts as muscles; since in nothing else do they bear a resemblance to the muscular structure in the more perfect animals with which we are best acquainted.

‘ We shall illustrate this observation by a description of the structure, and actions, of the animals called hydatids, which appear from their simplicity to be the furthest removed from the human; for as the human is the most complicated, and most perfect in the creation, the hydatid is one of the most simple, and composed of the fewest parts. It is to appearance a membranous bag, the coats of which are so thin as to be semitransparent, and to have no visible muscular structure. From the effects produced by the different parts of this bag while the animal is alive, being exactly similar to the contractions and relaxations of the muscular fibres in the human body, we must conclude that this membrane is possessed of a similar power; and consequently, has the same right to be called muscular.

‘ The hydatid, from its apparant want of muscles, and other parts which generally constitute an animal, was for a long while denied its place in the animal world, and considered as the production of disease; we are, however, at present in possession of a sufficient number of facts, to ascertain, not only that it is an animal, but that it belongs to a genus of which there are several different species.

‘ Hydatids are found to exist in the bodies of many quadrupeds, and often in the human; the particular parts most favourable to their support appear to be the liver, kidneys, and brain, although they are sometimes detected in other situations.

‘ One species is globular in its form, the outer surface of the bag smooth, uniform, and without any external opening; they are seldom found single, and are contained

contained in a cyst, or thick membranous covering, in which they appear to lie quite loose, having no visible attachment to any part of it. This species is most frequently found in the liver and kidneys, both of the quadrupede and human subject. They vary in size, but those most commonly met with are from one quarter of an inch to three quarters of an inch in diameter.

• Another species is of an oval form, with a long process or neck, continued from the smallest end of the oval; at the termination of which, by the assistance of magnifying glasses, is to be seen a kind of mouth; but whether this is intended merely for the purpose of attachment, or to receive nourishment, is not easily determined. This species is found very commonly in the brain of sheep, and bring on a disease, called, by the farmers, staggers. It is not peculiar to any part of the brain, but is found in very different situations; sometimes in the anterior, at others in the posterior lobe. It is inclosed in a membranous cyst, like the globular kind; but differs from that species, in one only being contained in the same cyst; and the bag, or body of the animal being less turgid, appearing to be about half filled with a fluid, in which is a small quantity of white sediment; while the globular ones are in general quite full and turgid.

• This species, from its containing only a small quantity of fluid, has a more extensive power of action on the bag, and is therefore best fitted for illustrating the muscular power of these animals.

• If the hydatid be carefully removed from the brain, immediately after the sheep is killed, and put into warm water, it will soon begin to act with the different parts of the body, exhibiting alternate contractions and relaxations. These it performs to a considerable extent, producing a brisk undulation of the fluid contained in it; the action is often continued for above half an hour before the animal dies; and is exactly similar to action of muscles in the more perfect animals. This species of hydatid is very well known by the name, *tænia hydatigena*;



*gena*; it varies considerably in its size, one of those which I examined alive was above five inches long, and nearly three inches broad at the broadest part, which makes it nine inches in the circumference.

‘ The coats of the hydatid, in their recent state, exhibit no appearance of fibres, even when viewed in the microscope; but when dried, and examined by glasses of a high magnifying power, they resemble paper made upon a wire frame. This very minute structure is not met with in membranes in general; it may therefore be considered as the organization upon which their extensive motions depend.

‘ The coats of the different species of hydatids had all of them the same appearance in the microscope.

‘ The intestines, in some of the more delicately constructed animals, have a membranous appearance, similar to the bag of the hydatid, and we cannot doubt of their possessing a muscular power, since there is no other mode of accounting for the food being carried along the canal. The action of the intestines, not coming so immediately under our observation, makes them a less obvious illustration of this principle than the hydatid; we may, however, consider their having a similar structure, as a strong confirmation of it.

‘ If we compare the structure of muscles in the human body, with that of the membranous bag, which composes the *taenia hydatigena*, a structure evidently endowed with a similar principle of action, the theories of muscular motion, which are founded upon the anatomical structure of a complex muscle, must be overturned.

‘ The simplicity of form, in the muscular structure of this species of hydatid, makes it evident that the complex organization of other muscles is not essential to their contraction and relaxation, but superadded for other purposes; which naturally leads us to suppose, that this power of action, in living animal matter, is more simple, and more extensively diffused through

the different parts of the body, than has been in general imagined.

‘ From these observations we shall find, that the inquiries hitherto made, into the principle of muscular motions, by investigating the muscles of the more perfect animals, which are most remarkable in their effects, and obviously most deserving of attention, have been too confined.

‘ From our inquiry into the structure of muscles, in different animals, we readily discover, that those above-mentioned, although the most perfect in their organization, are at the same time so complicated, for the purpose of adapting them to a variety of secondary uses, that they become, of all others, the kind of muscle least fitted for the investigation of the principle itself.

‘ In the present imperfect state of our knowledge, respecting animal life and motion, a physiologist, who would select a complex muscle, with the view of discovering, from an examination of its structure, the cause of muscular contraction, would resemble a man, ignorant of mechanics, who should consider a watch as the machine best constructed to assist his inquiries respecting the elastic principle of a spring; which, at first sight, must appear absurd. For although the spring is the power by which the motions are all produced, the machine is so complicated, with other important or necessary parts, that the spring itself is not within the reach of accurate observation.

‘ To prosecute an enquiry into the cause of muscular motion, with the greatest probability of success, recourse should be had to muscles, which are in themselves the most simple; and we should endeavour to ascertain what organization, or mechanism, is essential to this action in living animal matter, by which means we should acquire a previous step to the investigation of the principle itself.

‘ The complex muscles, in the more perfect animals, from their structure and application, open a wide field of inquiry; for we shall find that it is from their different



ferent organization, that they are enabled to perform the various actions of the body ; actions too powerful and extensive for muscles to effect, unaided by such complications of structure, and the advantages derived from it.

‘ In the present lecture, I shall confine myself to the consideration of the most important uses of the complex structure of muscles, and by this means make it evident, that they are not indebted to it for the principle upon which muscular motion depends.

‘ These complications are necessary to supply the muscle with nourishment, for the continuance of its action ; to give it strength ; to enable it to vary its contraction from the standard or ordinary quantity ; and to increase the effect beyond the absolute contraction of the muscle. How these different purposes are effected, I shall endeavour to explain.

‘ A muscle receives its nourishment from the blood, with which we find it more abundantly supplied than most other parts of the body. This supply is evidently intended for the support of its action, since it is proportioned to the exertions of the muscles ; and whenever a muscle is rendered incapable of acting, which frequently happens from the joints becoming stiff, the quantity of blood sent to it is very much diminished. The great vascularity of a muscle is, therefore, for the purpose of repairing the waste in the muscular fibres, occasioned by their action ; and without this support, the continuance of their contractions would be of short duration.

‘ The strength of a muscle must depend upon the number of its fibres, and most probably upon their size ; since, in strong muscles, the fibrous appearance is very obvious, while in very weak ones no such structure is visible to the eye. A distinction of fibres has been considered as essential to the contraction of a muscle, and only those parts have been allowed to possess that power, in which fasciculi of fibres could be ascertained. But from the observations which have  
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been made, it would perhaps be nearer the truth, to consider the circumstance of the fibres being distinct, as a proof of strength in a muscle, but not essential to the existence of muscular contraction.

‘ There is a power inherent in a complex muscle, by which it can increase or diminish the ordinary extent of its contraction; this is very curious, and must arise from some change going on in the muscle itself, for which it is adapted by means of this very complicated organization.

‘ The usual quantity of contraction, which takes place in the fibres of a complex muscle, in the different motions of the human body, is adapted in the nicest manner to the circumstances in which the muscle is placed; and the quantity of contraction appears to be limited by the fibres having no power of becoming shorter. We find, however, from observation, that when the extent of motion in a joint, or the distance between the fixed points of the muscle, is accidentally altered, the muscle acquires a power of adapting its quantity of contraction to the new circumstances which have taken place.

‘ This power in a muscle may be considered as a proof, that the principle of contraction is independent of its particular organization; since it can undergo a complete change within itself, so that its fibres shall be shortened to one half of their original length, and still have the same contractile power as when in its original state.

‘ The extent of this principle is well illustrated by the following case — A negro, about thirty years of age, having had his arm broken above the elbow joint, the two portions of the *os humeri* were unfortunately not reduced into their places, but remained in the state they were left by the accident, till the callous or bony union had taken place; so that when the man recovered, the injured bone, from the position of the fractured parts, was reduced almost one half of its length. By this circumstance, the *biceps flexor cubiti* muscle, which bends the  
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the fore-arm, remained so much longer than the distance between its origin and insertion, that, in the most contracted state it could scarcely bring itself into a straight line: this muscle, however, in time, as the arm recovered strength, adapted itself to the change of circumstances, by becoming as much shorter as the bone was diminished in length; and by acquiring a new contraction in this shortened state, it was enabled to bend the fore-arm.

‘ Some years after this accident, the person died, and the circumstances above-mentioned being known, the parts were examined with particular attention. The biceps muscles of both arms were carefully dissected out, and being measured, the one was found to be eleven inches long, the other only five; so that the muscle of the fractured arm had lost six inches, which is more than the half of its original length. These muscles are now deposited in Mr. Hunter’s collection of preparations, illustrating the animal œconomy.

‘ That muscles possessed this power has been taken notice of by Mr. Hunter, in a former lecture; but the instance which I have given, is so striking an illustration of this principle, that I could not avoid mentioning it while upon this subject.

‘ Muscular contraction is an operation, in whatever way performed, by which the vital stores of the animal are considerably exhausted; this is evident from the quantity of blood with which muscles, whose action is frequent, are supplied.

‘ This expence would appear, from observation, to be occasioned rather by the extent of contraction, than by its frequency or force; for if we examine the mechanism of an animal body, we shall find a variety of structures evidently intended for no other purpose than diminishing, as much as possible, the necessary extent of contraction in muscular fibres, while there is no such prevention of frequency of action.

‘ Muscles in general are applied to the bones in such way as to act with great mechanical disadvantages as:

to power ; but this is more than compensated by the small quantity of contraction which is required ; and in the muscles of respiration, we find frequency of action is preferred to an increased quantity of muscular contraction.

• The velocity of motion thus acquired, although a considerable advantage, does not seem to have been the principle object intended by such structure, but rather to procure the effect by means of short contractions, which are less fatiguing, or in some other way more in the management of the constitution, than long ones.

• That long contractions in a muscle cannot be supported for any length of time, may be illustrated from the actions, both of the voluntary and involuntary muscles.

• While the voluntary muscles are under the command of the will, we cannot ascertain, what would be the effects produced by the continuance of their contractions, since the influence of the brain, communicated by the nerves, becomes soon weakened, and puts a stop to their action ; but when the contractions of voluntary muscles are, by any circumstance, rendered involuntary, the difference in the time of their continuance appears to be in the inverse proportion of the quantity of contraction ; for muscles, whose usual functions consist in short contractions, can go on for a long time ; while those, which are performed by long contractions, soon cease.

• In the muscles of a paralytic arm, their action, to a certain extent, is continued for years, (the time of sleeping excepted,) without any effect being produced upon the constitution, or the parts themselves ; but in epileptic fits, in which the actions are equally involuntary, only requiring longer contractions, they soon cease, leaving the person greatly exhausted ; an effect which must arise from the quantity, not the frequency, of the contractions.

• If we attend to the actions of the involuntary muscles, we find that they are continued through life,  
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but that the quantity of contraction is very small ; and if, from any circumstance, the quantity should be increased, it cannot be continued, the parts being unable to sustain it for any length of time. The diaphragm and intercostal muscles act constantly in performing the functions of respiration, but they do not exert themselves to their full extent. In laughing, which is likewise an involuntary action, the contraction of these muscles are more extensive ; therefore, if continued, beyond a very short period, become so distressing, that a cessation necessarily ensues.

‘ Muscular contraction is never made use of in an animal body, where any other means can produce the same effect ; and for this reason elastic ligaments are frequently substituted for muscles ; even where muscles are employed, various means are applied to diminish the quantity of contraction.

‘ It is curious, in tracing the different forms of muscles, and in considering the uses for which they are employed, to observe how variously the fibres are disposed, evidently for the purpose of obviating the necessity of great contractions ; and the quantity of muscular action, saved by this mechanism, is greater, in proportion to the frequency and importance of the effect the muscle is intended to produce ; this appears to be invariably the case.

‘ Muscles, only occasionally called into action, have their fibres nearly straight, which gives no mechanical advantage ; the sartorius is an instance of this kind.

‘ Muscles frequently used, are more complicated, as those of the fingers are half penniform in their structure ; the muscle for raising the heel, in walking, is penniform ; that which raises the shoulder, complex penniform ; and those of the ribs cruciform.

‘ That the two sets of intercostal muscles act at the same time I proved, by experiments, in the year 1776. I removed a portion of the external intercostal muscles from the chest of a dog, and in that way saw, very distinctly,

tingly the two sets of muscles in action. The fibres of both sets contracted exactly at the same time.

‘ The particular structures of these different forms of muscles, and the mechanical advantages arising out of them, have been already explained in former lectures upon this subject; but there is a form of muscle, in which the disposition of fibres produces a considerable saving of muscular contraction, that has not been at all taken notice of.

‘ The muscle I allude to is the heart, the most important in the body, whether we consider the frequency of action, or the office in which that action is employed; and we shall find, upon examination, that the fibres are disposed differently from those of any other muscle; which disposition of fibres appears to have a superiority, in being enabled to produce their effect by a smaller quantity of contraction.

‘ In considering the muscular structure of the heart, it is only intended to examine that part of it called the ventricles, which may be reckoned two separate muscles. The right ventricle, for sending the blood through the vessels of the lungs, called the lesser circulation; the left, to propel it through the branches of the aorta, which go to every part of the body, called the greater circulation.

‘ If these two ventricles are superficially examined, the muscular partition, by which they are united, seems to belong equally to both, one half of it appearing to be a portion of the right, the other of the left, ventricle.

‘ In this view, the sides of the left ventricle, although evidently more muscular and thicker than those of the right, are by no means stronger, in proportion to the difference of effects they have to produce. We find, however, upon dissection, that the septum is almost wholly a portion of the left ventricle, which gives it a great superiority over the other, and makes it capable of performing the important office of supplying the body with blood.

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\* The left ventricle of the heart, detached from the other parts, is an oviform hollow muscle, but more pointed at its apex than the small end of a common egg. It is made up of two distinct sets of fibres, laid upon one another in the form of strata; those which compose the outer set have their origin round the root of the aorta, and, in a spiral manner, surrounding the ventricle to its apex, or point, where they terminate, after having made a close half turn. The fibres of the inner set, or stratum, are similar to those of the outer, in their origin, in the mode of surrounding the cavity, and in their termination, but their direction is exactly the reverse; they decussate the outer set in their whole course, and where the two sets terminate, they are both blended into one mass. There is an advantage gained by this disposition of fibres over every other in the body, which adapts the ventricle so perfectly to its office, that it would almost appear impossible to construct it in any other way, so as to answer the purposes for which it is intended.

‘ In this muscle, the fibres, by their spiral direction, are nearly one-fourth part longer than the distance between the origin and insertion; and the action of the two sets being in different directions, renders only one half the quantity of contraction in each fibre necessary, that would have been otherwise required; while the turn both sets make, in opposite directions, at the apex of the ventricle, fixes it, and prevents lateral motion.

‘ In the action of the ventricle, two different effects are produced; the first brings the apex nearer to the basis, by which means the *vis inertiae* of the blood will be overcome where the resistance is least, and a direction given to its motion in the course of the aorta; the second brings the sides nearer each other, which will accelerate the motion of the blood already begun; and the spiral direction of the fibres will render the power which is applied more uniform, through the whole of that action, than it could have been made by any other known form of muscle; the spiral action will also readily shut the val-  
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vulae mitrales, while the apex is drawn up, which could only be effected by this particular construction.

‘ By this beautiful mechanism, which I have endeavoured to describe, the muscular fibres of the left ventricle of the heart perform their office with a smaller quantity of contraction, compared to their length (although in themselves proportionally longer) than those of any other muscle in the body, and consequently produce a greater effect in a shorter time.

‘ The right ventricle is situated upon the outside of the left, with which it is firmly united; it is not oviform in its shape, but triangular; nor is it uniform in its structure, being made up of two portions, whose fibres have a very different distribution.

‘ The portion of this ventricle, which makes a part of the septum of the heart, consists of only one set of fibres, similar, in their direction, to those of the stratum underneath, belonging to the left ventricle; but from being considerably shorter, they are more oblique than the spiral, and at the edge of the cavity they are blended with the fibres of the opposite portion.

‘ That portion, which is opposite to the septum, is composed of three sets of fibres: those of the external set are nearly longitudinal; the two others, which lie under it, decussate each other, and are obliquely transverse in their direction, one passing a little upwards, the other downwards: and both terminate upon the edge of the septum.

‘ In the structure of this muscle, we find none of the mechanical advantages, so obvious in the left ventricle; the want of these, however, is in some measure compensated by its situation; for the blood contained in its cavities will have the *vis inertiae* overcome, and a direction given to its course by the action of the apex of the left ventricle: that motion only requiring to be continued, and accelerated, for which purpose the structure of this muscle is very well calculated; and in which it will also be assisted by the lateral swell of the septum into its cavity, in the contraction of the left ventricle.

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‘ In the course of this lecture, it has been my endeavour to show the most simple structure that is capable of muscular action; and to point out the advantages intended to be produced by the different complications which occur in an animal body.

‘ The view which I have taken of this subject gives us an idea of the extent to which muscular action is employed in different animals; and leads to the belief, that very dissimilar structures, in the more perfect animals, are endowed with this principle, since the actions of the smaller arteries, as well as the absorbent vessels, must be referred to it.

‘ To ascertain whether any such action could be demonstrated in the membranes of the quadrupede, I made the following experiments.

‘ These experiments were made upon the internal membrane of the urinary bladder of a dog, which, in consequence of the animal dying a violent death, was in a very contracted state; the whole of its contents having been expelled in the act of dying.

‘ The method I have adopted to ascertain the muscular power of this membrane, is similar to that taken by Mr. Hunter in his very ingenious investigation of the structure of blood-vessels, which was laid before this Society; the same mode being equally applicable to the present subject.

‘ The bladder was carefully laid open, and a portion of its internal membrane, which was coagulated into folds, was dissected off. This portion was spread out, so as to be completely unfolded; it was then laid upon a piece of plate glass, wetted, to prevent, as much as possible, any friction; its exact length, in this contracted state, was three quarters of an inch; it was now stretched out, and found to be one inch and three-eighths; upon being left to itself, it contracted so as to be only one inch; so that, in this state, it had gained two-eighths of an inch, which must have been lost by some action in the living body, and entirely independent of its elasticity. This portion of membrane then had two powers of contraction,

tion, one which was muscular, and equal to two-eighths of an inch; the other elastic, and equal to three-eighths of an inch.

‘ Another portion of the same membrane, half an inch long, and three-eighths broad, was treated in the same way; and its muscular contraction was found to be one-eighth of an inch, that from elasticity four-eighths of an inch.

‘ A third portion of membrane, seven-eighths of an inch long, and two-eighths broad, was ascertained to have contracted two-eighths of an inch, by its muscular power, and three-eighths from its elasticity.

‘ It will scarcely be necessary to mention, that the muscular contraction, in this membranous structure, is very readily overcome, since this must be almost self-evident; that circumstance, however, must be particularly attended to in making similar experiments.

‘ The internal membrane of the urethra we know to be capable of contracting, as spasmodic strictures are formed in that canal. This membrane, when dried and examined in the microscope, has not the same appearance as the coats of the hydatid; but the whole is a congeries of vessels, forming a network. We must, therefore, suppose that the action is in these very minute vessels.

‘ From these experiments and observations, membranous structures are found to exert an action hitherto denied them; and it is equally evident, that this principle is applied to the purposes of the animal œconomy in a more extensive manner than has been generally imagined.

‘ To explain even the most obvious phænomena of muscular motion, must appear, from the above observations, to be attended with difficulty; how arduous then the task of investigating the principle upon which that motion depends; a principle as extensive as life itself, with which it is coeval, and indeed the only criterion we have of its existence.

‘ An endeavour to throw light upon that principle, has not been the object of the present lecture; I have only attempted to state some circumstances respecting  
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the mechanism employed in producing muscular motion, leaving to others the prosecution of this most intricate and difficult inquiry.'

The title of Mr. Cruikshank's paper is, *Experiments on the Nerves, particularly on their Reproduction; and on the spinal Marrow of living Animals*. It was read before the Society in the year 1776. The nerves, on which the experiments were made were, the par vagum and intercostal, a general description of which is prefixed. The neck was the place in which the nerves were divided, as it was there they could be got at with least danger, a circumstance, Mr. Cruikshank observes, which, by making an experiment more simple, makes it consequently more to be relied on. In order to put the animal to as little pain as possible, and make the operation short, he divided both nerves at once, as the separation is attended with considerable difficulty.

Exp. I. Jan. 24, 1776. — 'I divided, in a dog, one nerve of the par vagum, with the intercostal, on the right side. The symptoms, consequent to the operation, were heaviness, and slight inflammation of the right eye, breathing with a kind of struggle, as if something stuck in his throat, which he wanted to get up; fullness, and a disposition to keep quiet: the pulse did not seem much affected, nor had he lost his voice in the least. The unfavourable symptoms did not continue above a day or two; and on the eighth day he was in very high spirits, and seemed perfectly to have recovered.

Exp. II. February 3d. — 'I cut out a portion of the two nerves of the opposite side, in the same dog; the piece might be about an inch long. His eyes became instantly red and heavy; his breathing was more difficult than in the former experiment; he was sick, and vomited frequently; the saliva was increased in quantity, and flowed ropy from his mouth; his pulse in the groin was about 160 in a minute: he ate and drank, however, even voraciously at times, and had stools; he never attempted to bark or howl, probably because he did not feel great pain;

pain ; and yet his attention was not so much disengaged from internal uneasiness, as to be excited with ordinary causes from without ; in breathing, the inspirations were slow and deep ; the expirations were attended with repeated jerks of the abdominal muscles, as if he wanted more effectually to expel what air was contained in the lungs : the 7th day after this second operation, he was found dead, at a considerable distance from his bed. In the dead body every thing seemed in a sound state, except the lungs ; these contained little or no air ; in consequence of which they sunk to the bottom in water ; they were of a red brazen colour, resembling more the substance of a sound liver, than that of inflamed lungs. The inner surface of the trachea, and its branches, was exceedingly inflamed, and covered with a white fluid, in some places resembling pus, in others ropy, and more of the nature of mucus. The divided nerves of the right side were united by a substance of the same colour as the nerve, but not fibrous ; and the extremities formed by the division were still distinguished by swelling, rounded in form of ganglions. The same appearance had taken place, with respect to the nerves of the left side ; though the divided extremities seemed to have been full two inches apart ; the uniting substance was more bloody than that of the other side. This experiment was made, to prove that the original power of action in the thoracic and abdominal viscera was independent of the nerves. As I found the nerves regenerated, a circumstance never hitherto observed, it occurred to me, that it might be objected to the reasoning, that the two first nerves were doing their office, before the last two were divided ; to obviate this objection I made the following experiment.

Exp. III. Feb. 19. — ‘ I divided, at one operation, the four nerves, composing the first class in a dog. His eyes became instantly dull and heavy ; he tottered as he walked ; foamed at the mouth ; vomited two or three times ; breathed with excessive difficulty ; his inspirations were long and deep, his expirations short and sudden, but attended with repeated jerks of the abdominal



minal muscles, as in the last animal ; he barked loud every time he threw out the inspired air from his lungs ; the pulse was quicker than before the operation. Next morning, about half after eight, I found him apparently dead ; but, on examining more attentively, found he breathed still, though exceedingly slow ; his pulse was gone, and he felt cold ; his limbs were stretched out. On placing him near the fire, he began, in a few minutes, to breathe distinctly, and the heart now and then gave a pulsation ; in about four hours, he seemed to have got to the same state the operation first left him in, and barked at every expiration, his pulse then beating 50 in a minute. About four in the afternoon he died, having survived the operation twenty-eight hours. The lungs in the dead body were found loaded with blood, but not so much as to carry them to the bottom in water. The trachea was not inflamed. The nerves of the right side, from which a portion had been cut out, seemed to have undergone little alteration ; they were only a little more vascular than usual, and had the rounded swell where they had been divided. The nerves of the left side, which had retracted but little, and had been only divided, had their extremities covered with a plug of coagulable lymph. I suspected that the reason of the first dog's dying so soon, was, that none of the nerves had yet acquired the power of performing their former offices ; and that, were the operations performed at a greater distance of time, the animal would recover. With this idea, I was led to repeat my experiments, allowing a greater interval to take place between the first and second.

Exp. IV. March 6. — ‘ I repeated experiment 1. on a large dog. His eye on the right side seemed instantly affected ; looked dull and inflamed ; he coughed and breathed with some difficulty ; the secretions from the salivary glands were much increased ; he had tremors ; these, however, I attributed partly to fear, as on caressing him they disappeared. He ate and drank very well, and had stools. Most of these symptoms continued  
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but a few days, the eye becoming more clear, and the difficulty of breathing hardly perceptible; he vomited, but only after eating, a circumstance which often takes place in dogs in perfect health, from devouring their food too greedily. Thus he continued for three weeks; the external wound had healed, almost by the first intention; he ate greedily, and had perfectly recovered: I supposed the regenerated nerves might now be performing their offices.

Exp. V. March 27. — ‘ I repeated experiment 2. on the same dog, but did not remove quite so much of the nerves. He was stupid for a minute or two, and gasped for breath; but in a few minutes more these symptoms went off; in a quarter of an hour after he ate some boiled meat with his usual avidity; all the symptoms of the preceding operation again took place, and in the same order. The vomiting and difficulty of breathing were rather more considerable; he ate and drank notwithstanding, and had stools. The convulsive jerks of the abdominal muscles, which hardly took place in the last experiment, were observed in this during expiration, but were not constant, as in the first dog.

‘ On the 15th of April he was nearly as well as before the operations, only he was leaner, and perhaps weaker, from the confinement, as well as from the operations. I wished to see the state of the nerves; an artery was opened in the groin, and the animal expired in a few seconds. In examining the dead body, the viscera were all, to appearance, sound. The divided nerves of the right side, were firmly united; having their extremities covered with a kind of callous substance; the regenerating nerve, like bone in the same situation, converting the whole of the surrounding extravasated blood into its own substance. The nerves of the left side were also perfectly united; but the quantity of extravasated blood having been less, the regenerated nerves were smaller than the original; I observed too that they did not seem fibrous, like original nerves; but the  
recollection,



recollection, that the callus of bone is dissimilar to the original bone, quieted whatever doubts could arise from this circumstance. The tonsils were considerably inflamed, and this circumstance alone might be sufficient to account for the increased secretion of the saliva, an attendant symptom of most sore throats; though I have also seen an increase of viscid saliva, in the human species, from the hypochondriac affections of the digestive powers, and also from the causes of temporary debility. The regeneration of the nerves, which took place in the first dog, and which I think fully proved by this experiment, was a circumstance to me, then, unexpected and unthought of.

Exp. VI. April 19. — ‘ I divided the spinal marrow of a dog, between the last vertebra of the neck and the first of the back. The muscles of the trunk of the body, but particularly those of the hind legs, appeared instantly relaxed; the legs continued supple, like those of an animal killed by electricity. The heart, on performing the operation, ceased for a stroke or two; then went on slow and full; and in about a quarter of an hour after, the pulse was 160 in a minute. Respiration was performed by means of the diaphragm only, which acted very strongly for some hours. The operation was performed about a quarter of an hour before twelve at noon; about four in the afternoon the pulse was 90 only in a minute, and the heat of the body exceedingly abated, the diaphragm acting strongly, but irregularly. About seven in the evening, the pulse was not above twenty in a minute, the diaphragm acting strongly, but in repeated jerks. Between twelve at night and one in the morning, the dog was still alive; respiration was very slow, but the diaphragm still acted with considerable force. Early in the morning he was found dead. This operation I performed from the suggestion of Mr. Hunter: He had observed, in the human subject, that when the neck was broke at the lower part, (in which cases the spinal marrow is torn through,) the patient lived for some days, breathing by the diaphragm. This ex-

periment shewed, that dividing the spinal marrow at this place on the neck, if below the origin of the phrenic nerves, would not, for many hours after, destroy the animal; it was preparatory to the following experiment:

Exp. VII. April 26. — ‘ I divided all the nerves, of the first class, in a dog. The principal symptoms of experiment 3. took place. Soon after, I performed on the same animal, the operation of experiment 6. the symptoms peculiar to this operation also took place, whilst those, peculiar to experiment 3. disappeared. His respirations were five in a minute, and more regular than in experiment 3. the pulse beat 80 in a minute. Five minutes after, I found the pulse 120 in a minute; respiration unaltered; at the end of ten minutes the pulse had again sunk to 80 in a minute; respiration as before. At the end of fifteen minutes, the pulse was again 120; respiration not altered. The operation was performed at about two in the afternoon, at Mr. Hunter’s, in Jermyn-street. At three-quarters of an hour past five, the respirations were increased to fifteen in a minute, the pulse beating 80 in the same time, and very regularly; the breathing seemed so free, that he had the appearance of a dog asleep. At a quarter before eight, the pulse beat 80; respirations being ten in a minute. At three quarters of an hour after ten, respiration was eight in a minute, the pulse beating 60. The animal heat was exceedingly abated; I applied heat to the chest; he breathed stronger, and raised his head a little, as if awaking from sleep. At half past twelve, Mr. Hunter saw him; the breathing was strong, and twelve in a minute; the heart beating forty-eight in the same time, slow, but not feeble. He shut his eyelids when they were touched; shut his mouth on its being opened; he raised his head a little: but as he had not the use of the muscles which fix the chest, he did it with a jerk. Mr. Hunter saw him again between four and five o’clock in the morning; his respirations were then five in a minute, the heart beating slow and weak.

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We suppose he died about six in the morning, having survived the operation sixteen hours. This experiment I made from the suggestion of Mr. Hunter, with a view to obviate the objections raised against the reasoning drawn from the three first experiments. It was urged, that though by these experiments I had deprived the thoracic and abdominal viscera of their ordinary connection with the brain; yet, as the intercostals communicated with all the spinal nerves, some influence might be derived from the brain in this way. This experiment removed also the spinal nerves, and consequently this objection.

‘ As I found, by the two last experiments, that dividing the spinal marrow, in the lower part of the neck, did not immediately kill, although instant death was universally known to be the consequence of dividing it in the upper part of the neck, I expressed my surprise to Mr. Hunter, that the spinal marrow should, according to modern theory, be so irritable in the one place, and so much less so in the other.

‘ He told me, that from the time he first observed that men, who had the spinal marrow destroyed in the lower part of the neck, lived some days after it, he had established an opinion, that animals, who had the spinal marrow wounded, in the upper part of the neck, did not die from the mere wound; but that in dividing it so high, we destroyed all the nerves of the muscles of respiration, and reduced the animal to the state of one hanged; whereas, in dividing it lower, we still left the phrenic nerves, and allowed the animal to breathe by his diaphragm. If this opinion be well founded, though dividing the spinal marrow in the lower part of the neck does not kill instantly, whilst the phrenic nerves are untouched; yet, if I divide the phrenic nerves first, and then divide the spinal marrow in the lower part of the neck, the consequence, I said, will be the same as if I had divided it in the upper part.

Exp. VIII. ‘ By detaching the scapulæ of a dog from the spine, and partly from the ribs, I got at the

axillary plexus of nerves, on both sides, from behind. I separated the arteries and veins from the nerves, and passed a ligature under the nerves, close to the spine. I thought I could discern the phrenic nerves, and instantly divided two considerable nerves going off from each plexus. The action of the diaphragm seemed to cease, and the abdominal muscles became fixed, as if they had been arrested in expiration, the belly appearing contracted. His respirations were now about 25 in a minute, the pulse beating 120. As I was not willing to trust the experiment to the possibility of having divided only one of the phrenics (which I afterwards found was really the case), and some different nerve, instead of the other, after carefully attending the present symptoms, I divided all the nerves of the axillary plexus of each side. The ribs were now more elevated in inspiration than before; respirations were increased to forty in a minute; the pulse still beating one hundred and twenty in the same time. Finding that respiration went on very easily without the diaphragm, in about a quarter of an hour after dividing the axillary plexus of each side, I divided the spinal marrow as in experiment 6. The whole animal took the alarm, all the flexor muscles of the body seemed to contract, and instantly to relax again; he died as suddenly as if the spinal marrow had been divided in the upper part of the neck. I then opened the chest, and found the heart had ceased its motion; I immediately introduced a large blowpipe into the trachea, below the cricoid cartilage, and inflating the lungs, imitated respiration. The heart began to move again, and in about three minutes was beating 70 in a minute. I recollected that there was still a communication between the brain, and the thoracic and abdominal viscera, that the par vagum and intercostals were entire; and, turning to the carotids, divided the nerves. I then went on inflating the lungs as before; the heart, which had stopped, began to move again; beat 70 in a minute, and continued so for near half an hour after the animal had seemingly expired.

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These appearances were not confined to the neighbourhood of the heart; one of the gentlemen who assisted me, cried out once, that he felt the pulse in the groin, I now ceased to inflate the lungs, and presuming that I could easily re-produce the heart's action, allowed three minutes to elapse. On returning to inflate the lungs, I found the heart had now lost all power of moving; and that irritating the external surface with the point of a knife, did not produce the smallest vibration. On irritating the phrenic nerves, the diaphragm contracted strongly as often as the nerves were irritated. I irritated the stomach and intestines, which also renewed their peristaltic motions. I then irritated the par vagum and intercostals, about an inch above the lower cervical ganglion of the intercostal; the oesophagus contracted strongly through its whole length, but the heart continued perfectly motionless. On dissection, I found a small branch of a nerve, running down from the second cervical, to join the phrenic of the right side, but too insignificant to have any effect on the experiment. This experiment confirms those made by Mr. Hunter, in which he recovered the animals, by inflating the lungs, and on which his method of recovering apparently drowned people principally rests. It shews that respiration is the prime mover of the machine, and it takes off whatever objections might have been raised, from the animals, upon which he made his experiments, having the connection with the brain intire, (as the par vagum and intercostals were not divided,) since here the same thing took place in these experiments, where nerves could have no effect.'

In our next number we shall notice Mr. Home's second paper on muscular motion; as also Dr. Haighton's on the above subject.

ART. XXXIII. *Commentaries of the Royal Society of Gottingen, for the Years 1791 and 1792.*

**I**N the physical class of this volume we find a paper, the title of which is, *An Attempt to relieve Defects of Hearing*. By Lebrecht Fred. Benj. Lentin. — The principal purpose of this writer is, from the discoveries of anatomists respecting the structure of the internal ear, to suggest new methods of relieving defects in the sense of hearing. He begins with adverting to those branches of absorbents which take up the acoustic water from its receptacles, some of which discharge it through the small holes of the occipital bone, others into the lateral sinusses and jugular vein. In some cases of deafness, not to be attributed to other causes, he has given relief by stimulant applications or ulcerations on the occiput, first shaved. Ulcerations here are also of great use in that acute pain of the face, described first by Fothergill, the cause of which he supposes to exist in the hard nerve, and its ultimate ramifications. He has relieved, and at length cured it, by a mixture of opium and tinct: of asafœtida, conveyed to the bottom of the ear. The common ear-ache of children is a totally different complaint, and owing to spasm. He has cured it by the juice of rue, put into the ears.

Another cause of deafness may be an alteration in the quantity or quality of the water, filling the whole cavity of the labyrinth, and serving for the propagation of sonorous waves to the auditory nerve. This may become thick, turbid, or corrosive, and thus injure the hearing. The application of leeches, near the mastoid process, and on the occiput, and a succeeding mercurial friction to those parts, are likely means for relief.

The use of the Eustachian tubes, in assisting the hearing is well known, as likewise that their obstruction will injure the sense. The writer proposes an instrument, which consists of a bent silver probe, ending in a little plate, on which a piece of sponge is fastened, for the purpose of applying any deterfive liquors to the  
orifices



orifices of these tubes, and thus preparing the way for injections into them.

The defects of hearing, from *consent*, almost all arise from crudities in the intestinal canal, and are to be remedied by emetic and cathartic medicines. Others are *metastatical* in their origin; in which case regard is to be had to the primary disease. Congestions in the ears, from the suppression of periodical or other discharges of the humours, are further causes of deafness, and sometimes become perpetual. The want of due communication of oscillatory motions through the bones, and soft parts, to the organ of hearing, may be another source of this defect, at least we know that it is often relieved by exciting such oscillations. Many obscure and hitherto incurable diseases of the organ of hearing remain, the author observes, to exercise the industry and sagacity of future enquirers.

ART. XXXIV. *Transactions of the American Philosophical Society, held at Philadelphia.* Vol. iii. 1793.

AN Account of the most effectual Means of preventing the deleterious Consequences of the Bite of the *Crotalus Floridus*, or Rattle Snake. By BENJ. SMITH BARTON, M.D. — The writer, on a tour through the western settlements, made it his business to gain every possible information respecting the bite of the rattle snake, its effects, and cure. He found that a variety of vegetables were popularly reckoned good for bites of snakes, but among these were articles of the most opposite qualities; and he was well aware of circumstances which, at times, render the bites of the most venomous serpents harmless. On examining the matter more minutely, he found reason to believe, that notwithstanding the principal confidence is placed in internal medicines, yet that the external treatment was really the most important. In general, the first thing done, after a person was bitten, was to throw a tight ligature above the wounded

part, where capable of such an application. The wound was then scarified, and salt and gunpowder, either separately or mixed, were laid on it. Over the whole was applied a piece of the bark of the white walnut, which acts as a blister. At the same time, one or more of the vegetables, thought specific, are given in decoction or infusion, along with large quantities of milk. By these drinks a strong perspiration is excited, which undoubtedly may be of some service. This is especially effected in a violent degree by the juice of garden rue, which the Indians in Jersey give in the dose of two table spoons full every two hours. But the external means are first employed, which operate in preventing further absorption of the venom into the system, and evacuate that already admitted, by promoting discharges of blood and serum. When the venom has, through neglect, been so far absorbed, as to affect the next conglobatae glands, Dr. Barton advises the scarification of these glands, at the same time applying some vesicatory, of strong and speedy operation, of which he knows none more likely to be effectual than the *Ecorce de Garou* of the French, or bark of the *Daphne Gnidium*.

Sometimes the poison, instead of being conveyed to the blood through the slower channel of the lymphatics, is at once thrown into a vein or artery. In this case its effects are represented as most rapid, and usually fatal. The ligature and the use of rue, or some strong sudorific, seem here to afford the most probable means of relief. The Creek Indians generally practice sucking the wound made by a rattle snake, and some of the tribes cut out the part.

The symptoms of the introduction of this poison into the blood, are nausea, a full, strong, agitated pulse, swelling of the whole body, eyes entirely suffused with blood, often hæmorrhages from the eyes, nose, and ears, and sometimes copious bloody sweats. The teeth chatter, and the pains and groans of the sufferer indicate approaching dissolution. In this state, little seems capable of being done by medicine. The poison of the  
rattle



rattle snake is generally of a yellowish, somewhat greenish colour, which becomes darker in hot weather. It is observed to be more active during the coupling season.

The writer closes his paper, with strongly recommending an attention to the simple preventive means in this and other poisons, and with warning the observer against looking out for *specifics*. A credulity, in this respect, still adheres to some respectable writers, among whom Mr. le Page du Pratz, and even Linnæus, are enumerated. A list of vegetables, recommended by the Indians or whites in this case, is subjoined. The greater part of these are of the bitter and stimulant tribe.

ART. XXXV. *Memoirs of the Academy of Science and Belles Lettres, at Berlin.* 1792.

**M**EMOIR *on Absorption.* By M. WALLER. —The purpose of this Memoir is to refute the opinion generally maintained by the anatomists of the English school, and particularly in the work of Mr. Cruikshank, of the exclusive action of the lymphatic system in the function of absorption.

Mr. Waller begins with a definition of absorption, its cause, the nature of pores, the different kinds of vessels, and a short history of the discoveries of the circulation, and of the lacteal and lymphatic systems. These, as well-known matters, we shall not farther notice, but shall proceed directly to his remarks on the English writer.

The doctrine of *transudation after death* has been brought to the support of the new system of lymphatic absorption. Dr. Hunter and Mr. Cruikshank suppose, that transudation through pores does not take place till after the death of the subject. Dr. Hunter asserts, that if an artery in a dead subject is injected with a very subtil matter, the injection will pass into the cellular substance ;

substance ; but if it be coloured with vermilion, not a particle will pass this way, unless the coats of the arteries be lacerated. On this Mr. Waller remarks, that if the injection be very well prepared and applied, the matter easily penetrates into the cellular substance and the cavity of the intestines, without any rupture or extravasation. The obstacle usually met with proceeds from the particles of the vermilion, which not being sufficiently levigated, obstruct the minute ramifications of the vessels. A great degree of skill is also necessary in pushing injections, so as to go far enough, without such force as may lacerate.

Mr. Cruikshank observes that, in opening a dead body, the gall bladder, and contiguous part of the duodenum and colon, are found tinged with the hue of the bile ; and also, that the exterior coat of the stomach is of a deep red, from the exudation of the blood ; whereas neither of these circumstances are found in opening a living animal. Mr. Waller, on the contrary, has always found, even in living animals, and in men, opened very soon after a violent death, that the gall bladder, and neighbouring intestines, were tinged with the colour of the bile. He has found the external coat of the stomach of a pale red ; but supposing it were deeper after death, he should impute it, not to exudation, but to the accumulation of blood in the veins, which takes place after that period.

Mr. Cruikshank adduces, as a further argument, the case with which a solution of glue, injected in the coronary vein, passes into the pericardium ; as one into the veins of the pia mater passes into the ventricles of the brain ; whereas no such thing happens during life. Mr. Waller's reply to this is, that on injecting with a moderate degree of force, the liquor does not escape into these cavities ; that even this force is greater than that with which the blood is impelled during life ; and that, in injecting, the natural course of the fluids in the veins is inverted, going from the trunk to the branches, instead of the opposite direction. He therefore imagines,  
that



that the success of such injections proves either laceration of the vessels, or the existence of *absorbing orifices*, from minute ramifications of the veins.

In order to prove that transfusion is possible, even in living subjects, Mr. Waller remarks, that all the membranes, containing fluids, are furnished with physical pores — that they are also pierced by an infinite number of vessels, which are surrounded with loose cellular tissue, where they pass — that these pores, acting like the orifices of capillary vessels, would imbibe the fluids suited to their specific gravities — and that hence, not only transfusion, but absorption, through them, is possible. As an answer to Mr. Cruikshank's objection, that were this the case, there could be no dropsy of the thorax or abdomen, he observes, that the pores of the pleura and peritonæum may not be capable of admitting water, or that it may be poured out by the arteries too rapidly to be re-absorbed in equal proportion.

Mr. Cruikshank having asserted, that the odour of the semen is proper to its nature, and not derived from the exhalations of a volatile fluid, produced near the rectum, and penetrating through the pores of the feminal vessels, Mr. Waller first lays it down as a matter of fact, that the semen has a volatile odour, to which its energy is attached, and that this odorous principle is capable of being absorbed. He relates his examination of the body of a female, who died immediately after coition, in whom the fringes of the fallopian tubes were found embracing the ovaries, while the tubes contained semen, and their vessels were distended with blood, as if injected. He agrees with Haller, in imputing the nausea in women, after conception, in part to the absorption of semen. He next considers Mr. Cruikshank's assertion, that during life there is not only no transfusion, but that there is even no secretion of a fluid of a remarkably fetid and penetrating odour. In contradiction to this, Mr. Waller says, that on opening the abdomen of a living man, or other animal, a very penetrating and fetid odour is perceived; and that the  
reason

reason why the abdominal muscles are not rendered putrid by it, as they are after death, is, that the exhalations are immediately re-absorbed, and are either employed to give acrimony to other secretions, as the bile, or carried off by the emunctories. The same may be said with respect to the fetid matter of lumbar abscesses before they are opened.

Proceeding now to the question of absorption itself, the writer first considers that of the chyle ; and discusses the arguments brought to refute the co-operation of the vena portarum with the lymphatic system in this function. He gives an abridgment of the experiments of J. Hunter and Cruikshank, and makes a general objection to the inferences drawn from them ; which is, that the extreme sufferings of the animal must greatly alter the action of the vessels ; and, in particular, must probably cause such a contraction in the venous absorbing orifices, as to prevent them from performing their office. He confirms Boerhaave's argument, in favour of the absorption of the vena portarum, that its blood is not disposed to coagulate ; and questions the solidity of Mr. Cruikshank's opposite assertion ; and likewise attempts to shew that the chyle and lymph, which this vein may be supposed to absorb, would have the effect of preventing the coagulation of the blood. He then considers Boerhaave's argument, that this vein is too capacious for its correspondent arteries, whence it is probably destined to the reception of an absorbed fluid. He allows weight to Mr. Cruikshank's reply to this, viz. that all other veins also much exceed their arteries in capacity ; but observing that the quantity of blood is greatly diminished, during its course through the arteries, by the secretion, and by nutrition, he thinks that the superior capacity of the veins, notwithstanding this defalcation of the blood they receive, is a good argument for the supposition of their absorption. From a minute examination of the peculiar structure of the vena portarum, Mr. Waller is convinced, that it is intended to contain a quantity of fluids beyond that brought to it by  
the



the blood vessels. He distinguishes, however, two kinds of nutritive fluids, absorbed from the intestines; the one, that which, under a milky appearance, is imbibed by the lymphatics; the other, more gross and aqueous, which is taken in by the branches of the vena portarum.

Perfect obstructions, and even lapidifications, of the mesenteric glands are not uncommon, in which case nutritive absorption could not be performed by the lymphatics. Mr. Waller gives a figure of the lacteals and glands, of the jejunum, completely obstructed and indurated, in a man of thirty; and observes, that obstructions of this sort, from viscid and earthy juices, are very common in children. In very old people it is usual to find the lymphatic glands entirely shrunk away, and the vessels going to them obliterated. Yet these, if living on succulent diet, are sufficiently nourished.

The next proof advanced, of the absorption of the intestinal veins, is the smallness of the thoracic duct in proportion to the quantity of fluid which must pass through it, were the lymphatics the only absorbents. This is particularly remarkable in the copious and quick secretion of urine in drinking freely. Mr. Cruikshank has endeavoured, by calculations of the diameter of the thoracic duct, compared with the velocity of the fluid moving through it, to do away this objection; but Mr. Waller combats his arguments with other calculations and observations, in which he compares the great velocity of the blood, in its vessels, with the slowness of the lymphatic fluids, and concludes, that therefore the latter cannot bring necessary supplies to the former. With respect to the secondary lymphatic canal, in the interior mediastinum, anastomosing with the thoracic duct, on the aid of which Mr. Cruikshank places much dependence, Mr. Waller traces it principally from the liver, and asserts, that it may be filled by an injection from the vena portarum.

Mr. Cruikshank brings, as an argument for the absorption of the lymphatics, that in case of a total obstruction

struction of the cystic duct, when the gall bladder was distended with bile, he has found the lymphatic vessels of this bladder full of bile. Mr. Waller, however, on his own principles, accounts for it, by supposing, that after death the bile transudes through the teguments of the gall bladder into the cellular tissue, interposed between them, whence the lymphatics arise, and not from the internal surface of the gall-bladder.

He passes to the speedy cures of dropsies, which have long remained unaltered, which Mr. Cruikshank attributes to a sudden action of the lymphatics, roused to renewed power by some irritation. This idea is supported by M. Mascagni's experiments of injecting, soon after death, a coloured liquor into the thorax and abdomen, when the lymphatics of these cavities, and those on the surface of the intestines were always found to have imbibed the liquor. Mr. Waller, in similar experiments, found no such result; and Mr. Cruikshank himself, in his elaborate description of the lymphatics, gives no room to suppose that he has observed any in the pleura or peritonæum. In many cases of disease, in which a coloured liquor has been formed in these cavities, no sign of it has been discovered in the lymphatic system. And as to the theory, that dropsies are carried off by the sudden renewed action of the absorbents, Mr. Waller opposes it by another hypothesis, that the change is in the secreting arteries; which, from some cause, ceasing to pour out their fluids, the venous absorption, which was all the while going on, is now able to drain away all the formerly effused liquor.

Mr. Cruikshank found that, in the bodies of those who died of hæmoptysis, the lymphatics were filled with blood. Mr. Waller never observed this; but were it to be admitted, he thinks it would make nothing against the absorption of the veins; since, in the lungs there is exhalation enough to require the most speedy absorption; and from the viscous matter, mixed with the blood effused in pulmonic hæmorrhages, part of the fluid might still be left after death in the lymphatics.

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As to Mr. Cruikshank's idea, that air penetrates into the blood vessels of the lungs, and mixes with the blood, Mr. Waller thinks it necessarily requires venous absorption, since the rapidity of the blood's motion, in the arteries of the lungs, would infallibly prevent the penetration of any particles which did not come in the direction of that motion. He does not, however, admit the theory of the colour of the blood being derived from the air, but attributes the increased redness of the blood in the lungs to the compressure of its globules, in passing through the sinuosities of the pulmonary vessels.

He proceeds to absorption on the surface of the body. He begins with a brief account of the anatomy of the teguments, in which he divides the cutaneous vessels into two classes: those which open beneath the cuticle, and those which penetrate it. The former principally secrete the mucous juice of Malpighi, of which, thickened by absorption, and dried and condensed by the air and friction, the cuticle is formed, which is therefore an inorganic substance. As to the net-work of Malpighi, or rete mucosum, he thinks it intirely an imaginary body, and only formed by the anatomist, in separating some of the internal layers of the cuticle.

Exhalent and absorbent vessels also pierce the cuticle, and come to the surface of the body, where they effect transpiration and absorption. Their orifices, however, are not to be detected while the cuticle is entire; the reason of which, Mr. Waller thinks, is, that they receive a sort of sheath from the cuticle. This so contracts the orifices, that injections will not penetrate. But if the cuticle be stripped off, all the extremities of the vessels will then be truncated, and an injection will now pass to the very surface. On the same hypothesis the effects of blisters may be accounted for; which first, by their stimulus, occasion an increased secretion of the mucus of Malpighi, which detaches the cuticle from the cutis, and breaks off the ends of the penetrating vessels, which, consequently, pour out their contents; and

and re-absorption cannot take place while the cuticle continues intire.

The partisans of exclusive absorption, by the lymphatics, deny that the veins carry their extremities to the surface of the body. Mr. Waller asserts the contrary, from his success in making a most minute injection from the veins alone, in which their orifices can be distinctly seen with the microscope. A still more decisive proof he finds in the vascularity of steatomas, hydatids, poly-pusses, and other excrescences, which are full of veins and arteries, that are prolongations of the cutaneous vessels; whereas no lymphatics have ever been traced in them. His general conclusion, therefore, is, that lymphatics exist in the skin, originating from its interior surface, and the cellular membrane, and that they absorb; but he denies that they pierce the cutis and cuticle, so as to absorb from the surface of the body. Professor Haase, of Leipzig, however, asserts, that he has pushed mercury, in an injection of the lymphatics, as far as the exterior surface of the skin. Mr. Waller makes various objections to this experiment, attempting to show the probability of a laceration of the lymphatics; and that, at most, the lymphatics could only reach the outer surface of the cutis, and not penetrate the cuticle. As to the Professor's explanation of the œdematous legs of pregnant women, from compression of the lymphatics of the pelvis and ilia, Mr. Waller remarks, that, were this the cause, the lymphatics of the lower extremities must be found greatly distended, in consequence of a compression so long continued, which is not the case.

The writer terminates his Memoir with the following conclusion: — The lymphatics are absorbing vessels, properly so called; and in all parts, where there is cellular substance, they partake, with the veins, the office of absorption. They absorb the chyle, in conjunction with the vena portarum. In the breasts of women, the lymphatics alone perform the absorption of the milk. On the other hand, the veins alone perform absorption in all the cavities of the body, and on all its surface.

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ART. XXXVI. *Institutiones Therapiæ Generalis, auctore Joanne Christiano Gottlieb Ackermann. Therap. Prof. Pub. &c. &c.* — Altdorf, 8vo. 383 pages. — Imported by BOOSEY, London. Price 6s.

IT has been a frequent practice with professors of every branch of medicine to publish the system they have adopted in their schools, and that whether containing much of novelty or otherwise. Such a custom will at least have the effect of shewing the present state of the science ; and, by comparing this with former systems, point out the progressive improvements which may have been made. So far they certainly become useful. The present system is not remarkable for containing much new matter, and does not differ materially in its form from those which have preceded it.

We find, in the introduction to the work, a general view of the subject, from the most remote period to the present time. Soon after the time of Hippocrates, physicians, deviating from the only sure and safe path, that of observation and experiment, entangled themselves in a maze of unintelligible theory. Four elements, to wit, fire, earth, air, and water, with their corresponding qualities of heat, cold, dryness, and moisture, were used to account for all the changes which could take place in the animal body. Thus one of the elements was deficient, or it was too abundant ; or the proper mixture of the whole was wanting ; and hence the morbid affections were supposed to take their rise. This doctrine, reduced into form and order by Galen, was adopted by his immediate successors, by the Arabian physicians, and by all those who acquired their knowledge from that source. The *methodus medendi*, therefore, was built on these principles. The prevailing quality was to be corrected, the deficient was to be restored, or the too abundant expelled from the body. The whole of their *materia medica* consisted in calefacients or refrigerants, emollients, or driers ; and, lastly, of evacuants.

This system of therapeutics was first attacked by Erasistratus, who assigned, as the immediate cause of diseases, the escape of blood into the arteries\*; and this was again remotely occasioned by the aliment being in too large quantity, or indigested, or corrupted. This doctrine was afterwards altered by Epicurus and Asclepiades, with their followers, who supposed health to depend on the free and uninterrupted passage of the corpuscles through the pores, and that disease arose from this being interrupted; laying down two general causes of disease, constriction and relaxation; to which a third was added, compounded of the other two, which they called mixed. Their doctrine in therapeutics was, that constriction should be resolved, relaxation braced; and, in the mixed kind, the prevailing principle corrected. The other sects, amongst the ancients, who supposed the causes of disease to be hidden, made little alteration in the therapeutic part of medicine.

The ancient empirics made considerable alteration in this part of medicine, and doubtless to the advantage of the art. They, neglecting all those things which do not fall under the cognizance of the senses, allowed the art of medicine to consist only in the observation of diseases, and the manifest causes by which they are produced; and in the observation of those things which were found useful or hurtful (*juvantia & lædientia*) in particular affections, whether with respect to medicine or mode of living. Hence, they could have no general principles of healing as the methodists had. In their choice of remedies, they were guided, or professed to be guided, by experience alone.

Although, however, the empirics had established the only true foundation of the healing art, medicine still laboured under false and pernicious hypothesis. Physicians, from the second century, the Arabians especially, and their followers, adopted, as we have said, the doctrine

\* The arteries were supposed to be air-vessels, and not to contain blood.



trine of Galen. But after chemistry was discovered, the work chiefly of the Arabians, the whole attention of men being directed towards the analysis and composition of the metals, having found minerals to consist of salt, sulphur, and mercury, the same elements were supposed to enter into the composition of animal bodies, and the therapeutic art was founded on these principles, that the salt, sulphur, and mercury, in the body, should be augmented or diminished; or changed in respect of each other, according to the morbid alterations which had taken place.

After the restoration of learning, in the sixteenth century, when philosophy took a more consistent form, and the works of the Greek physicians began to be studied, and especially those of Hippocrates, many applied themselves to the cure of diseases, not on the ravings of hypothesis, but on principles, founded on a strict and cautious observation of nature, and the evident causes of disease. They rejected the unsupported theories of the Galenists, chemists, &c. This branch of the healing art was especially cultivated by Boerhaave, Gorter, and Hoffman, of the mechanical sect; and by Stahl, and his disciple, Juncker, who supported the organic theory. These, although busied in the construction of theories, applied them with caution in the actual treatment of diseases; and were, for the most part, guided by observation and experience.

At the present day, the action of the solids being better understood, as endowed with a vital principle, and as the chief agents, both in the preservation of health, and the production of disease; after an immense accumulation of facts and experiments, rejecting all unfounded speculations, the therapeutic branch of medicine has been rendered more consistent and useful by the labours of many celebrated men.

The order which M. Ackermann has adopted in the present treatise is as follows: he first considers the affections of the solid parts, in a mechanical point of view; and, in the next place, as endowed with vital energy.

Afterwards,

Afterwards, he treats of the diseased alteration of the fluids, both spontaneous and acquired. And, lastly, of the changes which take place in the excretions of the body.

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ART. XXXVII. *Observation sur une Ouverture faite à l'Estomac.* Par M. GEOFFROY. (*Extrait de la Médecine Eclairée, &c. Tome ii.*)

THE subject of this case was a woman, thirty-six years of age, who had been long subject to irregularities of the menstua, with frequent affections of the stomach, for which she had used various hot and irritating remedies. M. Geoffroy being consulted, found, on examination, in the epigastric region, a tumour excessively hard, of the size of a pigeon's egg. About a month afterwards, whilst going up stairs from dinner, she fell down suddenly, insensible. M. Geoffroy soon after found her cold, without pulse, and of a livid paleness. On coming to herself a little, some cups of tea were given her to drink; but the more she swallowed, the faster she sunk, and the abdomen swelled enormously. She died the same evening about eleven o'clock.

On opening the body, to discover the cause of so sudden a death, the cavity of the abdomen was found distended with the food and drinks she had taken the day before. On examining the stomach, the tumour was found, which had been externally perceived. It was hard, almost cartilaginous, and was situated near the lower orifice of the stomach, between its coats, and equalled in size a billiard ball. Notwithstanding its extreme hardness, an abscess had formed in the middle of the tumour, which had slowly suppurated; the external part of this cyst, being very thin, had burst, partly, probably, by the pressure of the food in the stomach, and partly by the efforts she had made in going up stairs. The opening was large enough to admit the little finger,



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ART. XXXVIII. *Medical Histories and Reflections.*  
Vol. II. By J. FERRIAR. M. D. &c.

( CONTINUED FROM PAGE 213. )

THE present volume contains the result of the author's observation and experience during the last two years. He proceeds, as in the former volume, on the cautious ground of experiment and strict induction, a method too much neglected by modern writers, though perhaps the only one that can be truly useful in the present state of medical science. His first essay is on the *Conversion of Diseases*.

A disease, the author observes, is said to be converted, when new symptoms arise in its progress, which require a different designation, and which either put a period to the original disorder, or combining with it, alter the physician's views respecting the prognostics, or the method of cure. Many instances of this kind are familiar, as the conversion of intermittents into continued fevers, or obstructions of the viscera; of hæmoptoe into phthisis, of jaundice into dropsy, and the like. Others are more unusual and unexpected, and deserve to be noticed, because they occasion much perplexity when they occur in practice, especially as this subject has been almost totally overlooked by medical writers.

VOL. II.

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After noticing the few authors who have treated on the subject, Dr. Ferriar observes, that it was formerly arranged under two divisions: 1. *Epigenesis*, or *propagation*; the original disease subsisting after the accession of the second. 2. *Metaptosis*, *metastasis*, or *translation*, the second disease putting a period to the first. This distinction, however, is not accurate, and would exclude many cases of conversion. Dr. Ferriar thinks it more useful to distinguish conversion by their influence on the event of the disease, as some are dangerous, and often fatal; others, while they terminate the original disorder, conduce to a more speedy restoration of health.

All cases of conversion may, perhaps, be conveniently referred to the following heads. 1. The supervening disease may be produced by the remote causes of the original disorder; in this case, the action of those causes, after producing its first effect, is prolonged so as to excite a new train of symptoms. 2. The supervening disease may arise from the excess, or combination of the symptoms of the original complaint. 3. The state of the habit, produced by the first disease, may give rise to a new disorder. 4. Conversions may happen from the imprudent suppression of habitual diseases. Anomalous cases may occur from the coincidence of independent diseases, or from the mixture of two or more of these sources of conversion.

Under the first head, Dr. Ferriar mentions pneumonic inflammation succeeding to typhus, by a continuance of the application of cold or dampness, or *vice versa*; mania and phrenitis succeeding to typhus; inflammation of the peritonæum, or villous coat of the intestines, to synochus; with many others. Under the second head, the author observes, that the symptoms of an idiopathic disease may, by their violence, assume the appearance, and require the attention due to a new complaint; or affections of particular viscera, which, in their incipient state, are only regarded as symptoms of general indisposition, may, as they gain ground, extinguish the original disease, or be protracted beyond it. Of this kind of conversion



conversion many examples are here adduced. Instances of the third mode of conversion are afforded in the change of continued fevers into different diseases, as paralysis, phthisis, nephritis, &c. And, lastly, the fourth mode of conversion may be observed, in epilepsy, produced by the retrocession of the itch; in melancholy and madness by the suppression of habitual drains, &c. Anomalous cases of conversion may be multiplied infinitely, not only by the combination of the different circumstances mentioned, but by the modes of treatment adopted by practitioners. Slight cases of synochus, Dr. Ferriar observes, are often converted to typhus, intermittents to continued fevers, and pneumonic inflammation to phthisis, by the improper practice of medical men.

Dr. F. concludes his observations on this very curious and important subject, by remarking, that as it appears, that many conversions are processes, instituted by nature for the cure of diseases, and that some of the most active remedies operate in a similar manner, we may not only improve the history of diseases, but the practice of medicine, by paying closer attention to the connection and operation of disorders upon each other. With this view of the subject, the most complicated cases will admit an instructive developement; and every additional fact may find a useful place. In pursuing this train of observation, we may be confident, that we are really following the order of nature, and that the result will be, not an arbitrary system, but an accession of solid and applicable knowledge. Thus a foundation may be laid, for a natural arrangement of diseases, and a just theory of the sanative motions of the human system.

THE subject of the second essay is *Insanity*. After some general observations on this affection, the author remarks, that he has very generally found congestion in the brain, and an effusion of water into the ventricles, on examining the heads of melancholics after death: he has never been able to trace any connection between the



symptoms of the disease, and the appearances on dissection, except in the cases of conversions to epilepsy, from maniacal disorders of long standing.

All degrees of insanity, which affect the temper more than the understanding, according to the author's observation, are obstinate. Maniacal disorders in women are commonly aggravated about the period of menstruation, though a mitigation of the paroxysm, or even a complete intermission, often follows the period, in recent cases.

The most general causes of insanity appear to be, hard drinking; accompanied with watching; pride; disappointment; the anguish, arising from calumny; sudden terror; false opinions respecting religion; and anxiety in trade. Vomiting has been found useful, not only in removing disorder in the functions of the stomach, but also sometimes in diverting patients from capricious resolutions: Of this Dr. Ferriar gives the following instance. An elderly gentleman, in a state of melancholy, determined to retain his urine, and persevered in his resolution during three days and two nights, though evidently with great pain and difficulty. Some doses of emetic tartar were ordered to be mixed with his food, which he took with some caution: copious vomiting was excited, and at the same time he parted voluntarily with a large quantity of urine; the sudden stimulus given to the distended bladder, by the action of vomiting, proving too strong for his resolution. This caprice did not return upon him afterwards.

Blood-letting is only useful in maniacs who are young and plethoric, whose eyes are turgid or inflamed; who pass the nights without sleep, and whose pulse is quick and full. Purgatives are undoubtedly useful in most cases of insanity, but only when moderately given. The melampodium, so celebrated in antiquity, the author has found to have no advantage over common purgatives. He prefers calomel, with some hopes of advantage to be derived from it, as a mercurial preparation. In two cases it appeared to assist the recovery of the patient; but in many others it was used without advantage. Where a weak pulse, want of appetite, flatulence, emaciation,  
and



and expressions of grief and fear take place in melancholics, the liberal use of bark and wine is clearly indicated.

In the treatment of insanity, the discipline of the patient is perhaps the point of greatest importance. On this head, we shall quote the judicious observations of the author. ‘The management of the mind,’ he observes, ‘is an object of great consequence, in the treatment of insane persons, and has been much misunderstood. It was formerly supposed that lunatics could only be worked upon by terror; shackles and whips, therefore, became part of the medical apparatus. I have absolutely seen, among the rules of a lunatic hospital, one which declared, “that the keeper might beat the patients, provided it were done with discretion, and by order of the physician!” I will go no farther into this shocking subject; it is now unnecessary to withdraw the veil, which covers the tortures, the murders, which, at a former time, were inflicted on this wretched class of patients, in places provided for their reception. A system of mildness and conciliation is now generally adopted; which, if it does not always facilitate the cure, at least tends to soften the destiny of the sufferer.

‘I have seen great exertions thrown away, in attempting to influence lunatics by arguments, or to surprise them into rationality by stratagem. I never knew such endeavours answer any good purpose. The stories current in books, of wonderful cures thus produced, are, like most other good stories, incapable of serving more than once.

‘A system of discipline mild, but exact, which makes the patient sensible of restraint, without exciting pain or terror, is best suited to those complaints. In the furious state, the arms, and sometimes the legs, must be confined, but this should never be done when it can possibly be avoided. When the patient is mischievous and unruly, instead of ordering stripes, I shut him up in his cell, order the window to be darkened, and allow him no food but water-gruel and dry bread till he shews

tokens of repentance, which are never long delayed, upon this plan. Previous to this kind of punishment, I find it useful to remonstrate, for lunatics have frequently a high sense of honour, and are sooner brought to reflection by the appearance of indignity, than by actual violence, against which they usually harden themselves.

‘ It is owing to the sense of restraint, that lunatics recover more quickly when they are removed from home. While they remain with their friends, the disease seems to acquire additional strength, from the concern and exclusive attention of which they are the objects; among strangers, they find it necessary to exert their faculties; and the first tendency to regular thinking becomes the beginning of recovery. It must be acknowledged, that the desire of returning home sometimes grows ungovernable in melancholics, and it becomes necessary to indulge them with a short interview with some object of particular attachment. At such times, it is dangerous to relax too much, and to favour the error, under the influence of which their partial relations mistake the earnest desire of returning, for the revival of reason. Much self-restraint, much eloquence, and artifice, are often shewn by the patient on these occasions; which, according to the management of the attendants, prove either salutary or mischevous.

‘ Though I would exclude every thing painful and terrible from a lunatic-house, yet the management of hope and apprehension, in the patient, forms the most useful part of discipline. Small favours, the shew of confidence, and apparent distinction, accelerate recovery; while seclusion and solitude, diminution of light, and privation of the customary food, mitigate the furious and malicious patients.’

IN pursuance of the author’s former plan, for establishing some general rules for the cure of *dropsy*, that subject is here resumed. Fifty-six cases are related, the treatment of which was various. We shall, as before, confine ourselves to the general result, premising, however, that in  
our



our judgment, the author has formed no conclusions which are not warranted, both by the number and accuracy with which the particular observations are related.

‘ On reviewing the events of these cases, the preference I had determined to give the cream of tartar, in dropfical diseases, appears fully justified. Of thirty-three cases, in which I have used this remedy, since the publication of my former volume, twenty-four have been cured, and two relieved: of the number cured, two were cases of hydrothorax, fifteen were the most dangerous complications of dropfy, five were cases of ascites alone; the rest of anasarca. I have purposely omitted several slight cases; and, on the contrary, I have excluded other cases, where the imminent hazard of the patient’s life afforded no time for the fair trial of medicines. The digitalis appears, in this set of cases, to great disadvantage indeed; but I confess, that my attention has been diverted from it by my success with cream of tartar, a remedy liable to no bad consequence from indiscretion, either of the practitioner or the patient. I am of opinion, however, that the employment of digitalis, as a secondary remedy, of which *Bowkers’s* case is an example, may be attended with the best effects; and it cannot be denied, that sometimes, digitalis will succeed when other remedies have failed; but this happens with many other diuretics.

‘ To arrive at more just conclusions, it will be proper to compare the result of all the cases of dropfy, mentioned in these volumes.

‘ Cream of tartar has been given in forty-three cases; of these, thirty-three have recovered; nine have died; three have been relieved.

‘ Digitalis has been given in twenty-nine cases; of which eleven were cured; seven died; two were relieved; nine were not relieved.

‘ The tonic pills have been given in twelve cases; of which six were cured; three died; two were greatly relieved; another received no benefit.

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‘ The bark, with tincture of cantharides, cured four cases of dropfy from conversion; and relieved *Ramsden* more than any other remedy had done.

‘ The cases of *Coxe*, and *Mary Smith*, afford two rare instances of the beneficial effects of mercurial friction; joined with a diuretic, in dropfy of the ovarium.

‘ The other remedies were given in too small a number of cases to justify any general conclusion.

‘ It appears evidently, from this comparison, that the greatest proportion of cures, out of an hundred and three cases, has been incontestibly effected by cream of tartar.

‘ The digitalis has produced a smaller number of cures, in proportion, than any other medicine employed.

‘ That it is useful, in some habits, to exchange the employment of cream of tartar for that of digitalis; or perhaps more frequently to unite their action, by exhibiting digitalis in the evening, when the purgative operation of cream of tartar, for the day, is exhausted.

‘ That the employment, and especially the repetition of tapping, tends to accelerate the subsequent accumulation in ascites.

‘ That in exhausted dropfical habits, where there is no permanent obstruction of the viscera, or where such an obstruction has been removed by other remedies, tonics may be advantageously joined with stimulating diuretics.

‘ That the free, and long-continued use of mercury, sometimes brings on a depression of strength, and irritability of the bowels, from which it is difficult to recover the patient.

‘ Lastly, that when diuretics act successfully, they in most cases operate early. Hence the advantage of exchanging diuretics, at the beginning of the disease. It appears, likewise, from some of these cases, that the employment of a diuretic, which had failed at the commencement, may be resumed at a subsequent period of the disorder, with success.

‘ The power of cream of tartar, in curing hydrothorax, is completely established, by two cases in this volume.



lume, those of *Bradshaw* and *Newton*, added to those of *Farrer*, *Bayley*, and *Monk*, in the former. *Bradshaw* relapsed twice, and *Monk*, once, but both were cured by repeating their medicines. My observations thus support the opinion, delivered by some judicious authors, that hydrothorax alone is not an intractable species of dropsy.

‘ A remarkable instance appears of the hydragogue power of cream of tartar, even when it exerted no other sensible effect on the system.

‘ The greatest inconvenience which I have experienced in using this medicine, is, that in some habits it soon loses its purgative effect, and with that its hydragogue power. It then becomes necessary to give it in doses so bulky, that they are apt to offend the stomach. This might be avoided, by quickening it occasionally by the addition of a little gamboge. Formerly, it was supposed, that the occurrence of a diarrhœa checked the flow of urine, in the action of cream of tartar. I have had frequent proofs of the fallacy of this remark. The patients themselves have often observed, that the swellings abated, and the urine flowed more largely as they were more briskly purged by that remedy. Even digitalis sometimes purges, during a successful exhibition. In the case of *Dewerden* (vol. i.) and in another, of which I have preserved no other particulars, the action of digitalis supported a gentle diarrhœa through the whole progress of the cure.

‘ It appears from history 38 of this volume, that when ascites and anasarca are complicated, in debilitated habits, the anasarca sometimes gains upon the trunk of the body, while the ascites is lessening by proper remedies. From the same case, and from history 16, it also appears that high, puffy swellings, on the backs of the hands, are dangerous signs in such complications.

‘ The golden rod, anciently of great fame in nephritic and dropical disorders, operates in the dose of half a drachm of the dried powder, given three times a day, as a gentle purgative, but does not prove very diuretic. I may be

be allowed to mention here, that I have used it in several nephritic cases with success, in that dose. It is much more mucilaginous than the uva ursi, and is an agreeable bitter, with little or no astringency. The virga aurea is, indeed, an useful remedy in nephritics, but not more so than the uva ursi, or perhaps than many other bitters. I have always used it without opium.

‘ In history 42, the diuretic effect of mercurial friction, joined with spiritus ætheris vitrolici, was so powerful as to produce a constant flow, amounting to an incontinence of urine, in a very old and much enfeebled subject. The inconvenience was, in that case, removed by tonics: I have found it, in a smaller degree, produced by other combinations of diuretics, in old persons; but I do not remember to have seen it troublesome, excepting in cases where mercury had been freely used.

‘ Upon the whole, I think, we may conclude, that slow and gentle methods of treatment ought to be instituted, in all cases of dropsy, in which the general habit is affected, either by visceral obstructions, or by the length of the disease. That from the junction of cream of tartar with digitalis, interposing purgatives occasionally, much may be hoped; and that mercury should be considered as a resource, only after the failure of milder remedies, which produce a less sudden, and less permanent impression on the constitution.’

From a sufficient number of facts thus collected, the author observes, we might learn what remedies deserve a preference on the first trial; how long the exhibition of any single medicine may be continued, when signs of recovery do not appear from its use; and in what manner hydragogues may be intermixed with the greatest prospect of success.

THE fourth essay in this volume is on the *Prevention of Fevers in great Towns*. We have here many judicious observations, both with respect to the causes and prevention



prevention of infectious diseases among the poor in large towns. The author recommends the appointment of a committee of health, and the erection of public lodging houses, on the plan of barracks, or caravanferas. Were a plan of this kind adopted, with some suitable regulations, many important advantages, both with regard to the health and morals of this class of people, might be expected to ensue.

FIVE cases of *Dilatation of the Heart* are next related, in confirmation of the remarks suggested in the former volume. From these cases it appears, that dilatations of the heart may be retarded in their progress by different causes, and particularly by the action of diuretics; that in a certain stage of growth, this affection is not incompatible with general fulness of the habit; and even, during a certain period, with some degree of vigour; and that local inflammation, whether produced by specific disease, as gout, or by the action of rubefacients, possesses a power of alleviating this complaint, even when supported by organic lesions of the heart itself. Hence, perhaps, the utility of issues, in cases of angina pectoris.

THE last essay is, *On the Effect of Pneumatic Medicine*. This practice has not been as successful in the hands of Dr. Ferriar as it appears to have been in those of Dr. Beddoes. Eight cases of its application are here related. The first was a case of confirmed consumption, in which the hydrogen gas was exhibited; and, at first, with the relief of all the symptoms. In the course of some weeks, however, the progress of the disease, and the rigour of the season, overpowered the effects of the hydrogen; it ceased to give ease, though the dose was augmented, and it was at length discontinued.

The second case was of a lady who had been afflicted upwards of eleven years, with a severe spasmodic asthma. As she had been subject, several years before, to inflammatory

Inflammatory complaints in the chest, and there was reason to apprehend that considerable adhesion of the pleura had taken place, the author was induced to expect more benefit from the hydrogene, or hydro-carbonate. Great chillness in the limbs succeeded every exhibition of the air; the fits, however, were evidently postponed, for she enjoyed a more considerable interval of ease than she had experienced for two years and a half. The intense frost, to which she had always been remarkably sensible, at length brought on paroxysms, during which she used hydrogene, hydro-carbonate, and afterwards oxygene, without effect. The oxygene was exhibited, from the analogy of spirituous liquors, which frequently terminate an incipient paroxysm, in this species of asthma. Discouraged by this ill success, the remedy was laid aside for a short time; but on the recurrence of a fresh paroxysm, the hydrogene was again given, in the proportion of a third, or rather more, in a bladder which contained about six quarts. The relief was not immediate, nor suddenly complete; but in the course of a quarter of an hour she was able to walk up stairs to her room, and passed a tolerable night. Another paroxysm was stopped a few days afterwards in the same manner. She is still liable to returns of the spasm; but on the whole, has derived more relief from the pneumatic medicine, than from any other remedy.

The third was a case of palpitation of the heart. Conceiving that the distress might be lessened, by diminishing the stimulating power of the blood, the patient was put on a course of hydrogene, and afterwards of hydro-carbonate, without the least benefit. In the fourth instance, a single dose of oxygene was administered to an asthmatic patient, who felt great relief, immediately on inspiring the air. His death, which took place suddenly a few days after, prevented further trial.

In the fifth case, the patient had been long afflicted with severe cough, with inconsiderable expectoration. Great emaciation took place; the adnata of both eyes was of a pearly white, and the pulse small, and generally  
above



above an hundred. The hydrogen and hydro-carbonate both failed of affording relief. The sixth was a case of consumption, with hectic fever. The same gases were administered, and with some relief at first, but they soon ceased to produce any good effect.

The seventh was a case of peripneumony on the decline. The hydrogen was exhibited, without any sensible relief. The eighth case was a tubercular consumption of nine months standing. Not the least advantage was derived from the use of hydro-carbonate, after a trial of six weeks. Dr. Ferriar concludes the subject with the following observations.

‘ From these cases, as far as they extend, we cannot draw any conclusion highly in favour of the pneumatic medicine. No benefit was obtained from a long course of it, in a case of tubercular phthisis, where it was ascertained by dissection, that suppuration had not taken place. In a very recent case of phthisis (case 6) the relief afforded by the hydrogen was very trifling, not equal to what I have produced in similar cases, by common methods of practice. But what has most disappointed me, is the want of efficacy of this medicine, in a curable disease, a common case of peripneumony, in which the patient recovered by the usual remedies. Case 5, also, was greatly relieved from his complaints by ordinary medicines, after a long ineffectual course of hydro-carbonate. I have no reason to suspect want of accuracy in administering the gases here. They were prepared exactly according to Mr. Watt’s directions ; in the beginning of most of the observations, they were exhibited in my presence, and I have carefully noted every accidental omission. That they were given in doses sufficiently strong, is evident, from the intoxication or deliquium which was produced in most of these instances. On the other hand, it must be confessed, that the hydrogen gave much relief in case 1, in the advanced state of phthisis, and that some benefit resulted from it, in a chronic asthma (case 2).

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As far as my observation goes, therefore, I have only found the pneumatic medicine palliate, and even that effect has proved but transitory. From case 3 no conclusion can be drawn.

‘ I am aware, that no positive inference should be drawn from the small number of cases in which I have employed this method ; for I know that practitioners often meet with a series of cases, greatly favourable, or otherwise, to modes of practice, considered alone, which it is necessary to compare with the result of a great number of cases, indiscriminately taken. I shall, therefore continue to use the pneumatic medicine, but only in those disorders which prove intractable to common remedies, till I can arrive at certain conclusions respecting it. For I think it wholly inexcusable, to hazard the life of a poor patient, by substituting uncertain remedies, for those which experience justifies us in directing. But I confess that I shall proceed in my trials, with hopes much reduced, and with eagerness greatly abated.

‘ I was induced, by Mr. Cartwright’s account of the effects of yeast, in typhus, to order it in one case, in the intervals of administering the bark. The first dose produced such violent sickness, that I did not choose to pursue the experiment farther ; and I understand that the same effect has attended its exhibition by other practitioners.’

TO the work, in an Appendix, are added some remarks on Dr. Tatterfall’s “ Brief View of the anatomical Arguments for the Doctrine of Materialism.” These, as controversial, and purely metaphysical, we shall avoid entering into.



ART. XXXIX. *An Introduction to the Practice of Midwifery.* By THOMAS DENMAN, M. D. — Vol. II. London, 1795. — JOHNSON, 8vo. 527 pages, 7s.

**I**N the former volume, Dr. Denman had treated of natural labour, and of the preceding and accompanying circumstances. He had observed, that parturition is a process of the constitution, which, generally, does not require any assistance; and that when it is natural, it should be suffered to have its own course, without interruption, for the same reasons which render all interposition with other natural operations, unnecessary and improper. Whence then, he asks, arises the necessity or expediency of establishing midwifery as an art for the relief of the human species? or in what respects has society profited by the establishment? Certainly not on the presumption that women are by nature destitute of those powers, which at the time of parturition, are in all other creatures generally equal to the exigencies of their situation; nor when those powers are fairly exerted, every cause producing its effect, in the order and in the manner which the parts by their construction were framed to perform and undergo; nor, when there exist no uncommon impediments by which the effects to be produced by the natural causes, are, or may be obstructed. But as the aid of medicine becomes necessary, when from some defective, or irregular exertion of the native powers of the constitution; or from some adventitious cause of obstruction; or from some infirmity in the constituent parts of any of the organs of the body, the functions of any part are suppressed, impeded, or in some way rendered irregular, to the detriment of that part, or of the constitution: from the same causes, and in like manner, the assistance of the art of midwifery may be required for the relief of irregularities or difficulties in the act of parturition. The author then proceeds to investigate the causes which are capable of producing such impediments to the natural progress of parturition. He previously, however, lays down the following propositions:

1st. All



1st. All viviparous animals bring forth their young with pain. — 2. The degree of pain which they suffer, will depend upon the degree of their sensibility, natural or acquired, and upon the difficulty with which they bring forth their young. — 3. The difficulty with which they, in general, bring forth their young, depends upon their construction. — 4. By their construction, they are also endued with powers capable of overcoming all the difficulties to which such construction generally renders them liable. — 5. The process of parturition in animals is therefore to be esteemed a natural process, requiring no other assistance, than the exertion of those powers which depend upon their construction. — 6. The construction of the females of the human species is different from that of the females of any order of animals. — 7. The construction of the females of the human species is such, as to render them unavoidably subject, in general, to greater pain and difficulty in parturition, than the females of any order of animals. — 8. But by the construction of the females of the human species, and by the original formation of the head of the human *fœtus*, provision is made for overcoming all the difficulties to which the peculiarities of their construction may render them generally liable. — 9. With regard to the act of parturition, when natural, women are therefore to be esteemed on a similar footing with animals. — 10. But as women are by their construction, and by the customs of society, subject to diseases and accidents, which increase the natural difficulties and danger attending their parturition, from which the females of every order of animals are free. — 11. It will follow, that the occasions which require assistance at the time of parturition, must, of necessity, occur more frequently in women than in the females of any order of animals. — From these premises, the expediency and necessity of establishing midwifery as an art for the relief of the human species will appear, and the art be directed to its proper objects.

Sect. ii. c. 10. Treats of the presumptive signs of difficult labours. Sect. iii. on the definition and distinction of difficult labours. The general definition of difficult labours,



labours, which, however, he allows to be imperfect, is, “ those labours, in which the head of the child presents, and which are protracted beyond twenty-four hours : ” and these he divides into four orders : 1st. those labours which are rendered difficult from the inert or irregular action of the uterus : *Secondly*, those which are occasioned by the rigidity of the parts to be dilated : *Thirdly*, those which are occasioned by disproportion between the dimensions of the cavity of the pelvis of the mother and the head of the child : and, *Lastly*, those which are rendered difficult by diseases of the soft parts.

Under the first head are classed, the too great distention of the uterus ; — partial action of the uterus ; — rigidity of the membranes ; — imperfect discharge or dribbling of the waters ; — shortness of the funis umbilicalis ; — weakness of the constitution ; — fever or local inflammation ; — want of irritability in the constitution ; — passions of the mind ; — and general deformity.

Under the second order are included, first-cases ; — advanced age ; — the early rupture of the membranes ; — the oblique position of the os uteri ; — extreme rigidity of this part ; — or of the external parts.

The third order is subdivided into, cases of original smallness of the pelvis ; — distortion of the pelvis ; — head of the child uncommonly large, or too much ossified ; — head enlarged by disease ; — face inclined towards the pubis, and presentation of the face ; — head presenting with one or both arms.

The difficulties of the fourth order may arise, from suppression of urine ; — stone in the bladder ; — excrescences of the os uteri ; — cicatrices of the vagina ; — adhesion of the vagina ; — steatomatous tumors ; — rupture of the uterus.

Having enumerated these causes of difficult labour, and before proceeding to point out the means of relief, the author observes, that the causes of difficulty are generally combined ; and as there are very few instances of a disease, according to the simple definition of it, in nosological writers, so there are few examples of difficult



labours produced or attended by one single cause. Together with the dribbling of waters, there will often be a retraction of the head of the child from the shortness of the *funis*; and with great rigidity of the parts, or a small *pelvis*, there may be a weak action of the *uterus*, and so on to an almost endless variety. One cause will however predominate, and of course become the principal object of our attention. But when by time, or art, that cause is removed, we must apply ourselves to the removal of that which is important in the next degree; and sometimes the same means may be properly used for the removal of difficulties proceeding from several different causes.

“ But besides,” Dr. Denman observes, “ the causes already mentioned, there is one much more frequent than the rest, which is the derangement of the order of the labour by an officious interposition, or by improper management. Upon this subject it would be unpardonable to make an assertion which is not supported by experience; but I am fully convinced that the far greater number of really difficult labours to which I have been called, and I must not conceal the truth on this occasion, some of those which have been originally under my own care, were not of that denomination from unavoidable necessity, but were rendered such by improper management. Nor does the disturbance of the order of a labour, depend upon the practitioner alone; for the intractability of the patient herself, or of her friends and attendants, which though it may be founded in affection and compassion to her sufferings, may also arise from many other motives, is too frequently productive of the same effect.”

The author next proceeds to explain the use of instruments; the intentions in using which may be of three kinds: first, to preserve the life both of the parent and child; secondly to preserve the life of the parent; and thirdly to preserve the life of the child. The instruments contrived to answer the first intention, are the *fillet*, the *forceps*, and the *veitis*. Of each of these, with the collateral circumstances, he speaks in turn.



On the comparative advantages of the *forceps* and *vectis* we meet with the following observations. “ The comparison between the two instruments has never been brought fairly to an issue ; which might have been done by a discussion of the two following questions : 1. ‘ Is it possible to deliver a woman safely with the *vectis*, in any case not manageable with the *forceps* ? 2. Is it possible to deliver a woman safely with the *forceps*, in any case not manageable with the *vectis* ?

“ We may take it for granted, and I believe it is true, that in far the greater number of cases which occur in practice, either of these instruments may be used indiscriminately, with equal safety, advantage, and ease, allowing for the dexterity which may have been acquired by the habit of using either instrument. But I do not recollect that those who have preferred the *forceps* have asserted that they could deliver a woman, in any case of difficulty not manageable with the *vectis* ; and, as far as my experience enables me to judge, such a claim in favour of the *forceps* could not be supported. The debate on this point of the question has not turned upon the superior efficacy, but upon the greater safety and facility with which the *forceps* might be used ; though one solitary case of very late occurrence, not candidly, nor judiciously stated, hath been brought forward to prove the superiority of the *forceps* to the *vectis*. But I have not heard of any well authenticated instance, in which after being foiled with the *vectis*, any operator who had acquired a commonly dexterous use of that instrument, was able to succeed with the *forceps* ; though it is worthy of notice, that those who are accustomed to the use of the *forceps* only, think themselves at liberty to depreciate the *vectis* ; and those who do not use them, speak of the *forceps* in terms bordering on contempt.

“ With respect to the second question, we will take the facts and relinquish the arguments, used by those who have preferred the *vectis* to the *forceps* ; which I allow sometimes to have been extravagant, as is not unusual with those who are the introducers of novelties



to public notice. If any confidence is to be placed in medical reports, it appears that many cases have occurred in which, after the introduction of the first blade of the *forceps*, it has been extremely difficult, or impossible, without the hazard of mischief, to introduce the second blade, and the operation has been performed with the single blade, used as a *vectis*. Of this I have known and been informed of several instances. It appears also, that before the head of the child has been so low down as was stated to be eligible for using the *forceps*, that the *vectis* has sometimes been readily applied, and effectually used, with safety both to the mother and child, when the necessity of some particular case required it. When the head of a child has not only been high up, but locked also in the *pelvis*, when there was not space sufficient to admit the two blades, or more force perhaps been required than the *forceps* enable us to exert, and we should otherwise have been compelled to lessen the head, it has been feasible to apply the *vectis*, and the patient has been safely delivered, with a probable chance of preserving the life of the child; but of this I have not myself known any instance. Moreover, in all the deviations from that position of the head, which is most natural, as when it is turned with the face towards the *pubes*, or when the face presents, in which it is allowed that the *forceps* cannot be used with the utmost advantage or certainty; in all such cases, I know, the *vectis* may be applied and used both with safety and efficacy. From this statement it may be presumed, that the *vectis*, prudently used, is, in every case, an equally safe and efficacious instrument with the *forceps*, and a better adapted instrument in many cases which occur in practice. It is with this persuasion that several teachers of the art of midwifery in London, at the present time, never use the *forceps*, or speak of them in their lectures; while others, to whose judgement I owe much respect, continue to use the *forceps*, and think I have advanced more than experience will justify, in favour of the *vectis*. But these different opinions respecting the preference due to the *forceps* and

*vectis*



*vectis* prove to my mind, that in the generality of cases, either instrument may in expert hands be used with equal safety and advantage. I may also be permitted farther to observe, that I know several gentlemen of eminence, in the early part of their lives, accustomed to use the *forceps*, who discovering by accident or trial, that they were able to afford every assistance with a single blade, have abandoned the *forceps*, afterwards never using more than a single blade, or the *vectis*; but I never knew an example of any person who, having been accustomed to the *vectis*, relinquished its use and resorted to the *forceps*. The reader will observe, that in giving my opinion of these instruments, I do not speak of their abuse, but of their use on really necessary occasions; and will be assured that I consider disputes about the preference of instruments among the frivolous and most unworthy occupations of men of understanding.

Under the second head of intention in the use of instruments, the author treats of lessening the child's head; — on the signs and causes of death in the foetus; — of the propriety of bringing on premature labour; — and of the section of the symphysis pubis.

On the subject of bringing on premature labour, the importance and novelty\* of the practice require, that we should give the author's observations on this matter in his own words. After answering some objections of little weight, which had been made to the moral rectitude of the practice, he observes; — “As to its safety, having reasoned upon the structure of the parts concerned in the operation, and having carefully attended to all the circumstances which have occurred when it had been performed in eight cases in which I have either performed it, or it has been done by my advice and persuasion, I

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\* About the year 1756, there was a consultation of the most eminent men in London, to consider of the moral rectitude of, and advantage which might be expected from, this practice. Notwithstanding they generally approved of it, it has seldom been since practised, and its advantages are, we apprehend, very little known.



have not known one untoward or hazardous accident that could be imputed to it. I therefore feel authorized to say, as far as my reason or experience enables me to judge, that the operation of bringing on premature labour is perfectly safe to the person on whom it may be performed.

“ But respecting the utility of the operation, the statement first made of the intention or purpose with which it may be done, that is, to try whether the head of a small child will not pass through a *pelvis* too much narrowed in its dimensions to allow one of a common size to pass; will shew that the objects of the operation are circumscribed within certain limits. Should the cavity of the *pelvis* be of its natural size this operation is out of the question, and never can be required on that account. If the cavity of the *pelvis*, though reduced in its dimensions, would permit the head of a child to be squeezed through it by the force of strong and long continued pains, this operation is not required, and ought not to be performed. If the *pelvis* be so far reduced in its dimensions as not to allow the head of a child of such a size as to give hope of its living, to pass through it, the operation cannot be attended with success. It is in those cases only in which there is a reduction of the dimensions of the *pelvis* to a certain degree, and not beyond that degree, that this operation ought to be proposed or can succeed.

“ It would be highly satisfactory to state with precision the exact dimensions of the cavity of the *pelvis* of the person on whom it might be needful to perform this operation, and on whom it might be performed with success. But, as all the instruments contrived for measuring the *pelvis* in the living woman, too imperfectly answer this purpose to enable us by them to form a guide of practice, and as the head of a child before it is born can never be accurately measured, the determination must be left to opinion; and those who are experienced will not commit any great mistake in their conjectures. Under circumstances and in situations just preventing the  
successful



successful use of the *vedis* or *forceps*, and just compelling us to the fatal measure of lessening the head of the child, it may become a duty to propose, on a future occasion, the bringing on premature labour; at seven months, or any later time, according to our sense of the disproportion between the head of a child and the cavity of any particular *pelvis*. It can hardly be doubted but that the casual events of practice first inspired the notion of this method in the mind of some person who, adverting to the fortunate termination of premature labours coming on spontaneously, in cases of distortion of the *pelvis*, endeavoured to imitate by art what not unfrequently happens naturally.

“ There is another situation in which I have proposed, and tried with success, the method of bringing on premature labour. Some women, who readily conceive, proceed regularly in their pregnancy till they approach the full period, when, without any apparently adequate cause, they are in the habit of being seized with a rigor, and the child instantly dies; though it may not be expelled for some weeks afterwards. In two cases of this kind I have proposed to bring on premature labour, when I was certain the child was living, and have succeeded in preserving the children without hazard to the mothers. There is always something of doubt in these cases, whether the child might not have been preserved without the operation; but, as such cases often come under consideration, and as I am disclosing all that my experience has taught me, it seemed necessary to mention this circumstance.

“ I may be allowed to conclude this subject without entering into a detail of the manner in which premature labour may be brought on; because no person qualified to decide on the propriety of this operation can be ignorant of the manner of performing it. I must however observe, when the membranes of the *ovum* are punctured or ruptured, and the water discharged, that the time when the action of the *uterus* may come on will be very different; this happening in some instances in  
twelve



twelve hours, and in others not for twelve or fifteen days. During this interval we have only to wait patiently for the event, and when the pains come on, the labour, if natural, is to be suffered to proceed without interruption; or, if irregular, such assistance is to be given as the peculiarity of the case may require."

The objections to the section of the symphysis pubis, and to the Cæsarean operation are so obvious, that it is unnecessary particularly to notice these subjects.

THE third CLASS of labours are those called PRE-TERNATURAL. This term applies merely to the position of the child, without reference to the mother.

CLASS 4. Anomalous or complex labours: include four orders; first, labours attended with hæmorrhage; those attended with convulsions; those where there are two or more children; and, lastly, those where there is a descent of the funis before the child.

With regard to the treatment of convulsions, Dr. Denman dissuades us from artificial delivery in the first stage of labours. In the latter stages, he leaves the question rather undecided; he is averse, however, to lessening the child's head.

THE last chapter treats of the management of women in child-bed, and of the puerperal fever. On the former subject, much difference of opinion has existed. Some have recommended a strict antiphlogistic treatment, whilst the most common practice has been of a very opposite nature. The proposal of allowing a diet more plentiful in quantity, and more cordial in quality, was founded on the presumed necessity of guarding against the consequences of that weakness, which was thought to be occasioned by the circumstances attending child-birth. Then was recommended the custom of supplying to the constitution those deficiencies which might be occasioned by the uterine discharges, by plentiful living, and caudle was dispensed with an unsparing hand to remedy every temporary inconvenience.

Sweating




Sweating too has been advised, on the presumption, that what was found to terminate fevers, would be likewise powerful in their prevention. And by some it has been imagined, that a woman lately delivered ought to be treated as if she had been injured by a concussion or violent bruise of some internal part. On this principle the use of spermaceti was adopted.

On this subject the author states his sentiments as follows. “ It was observed that a state of pregnancy was an altered, but not a morbid state. The same observation may be made with equal propriety and truth of a woman in actual labour, and of women in the state of child-bed, which, though sometimes accompanied with diseases, cannot seriously be suspected to be of necessity connected with them. One moment’s consideration and view of the happy and perfectly safe termination of labours in general among the mass of women in this predicament, must convince us to the contrary. Before we therefore fix upon this or that method of treatment, it is worth our trouble to enquire, whether it be necessary to establish any peculiar method.

“ When a woman is recently delivered, the attending circumstances reduce her to the state of a person who has had profuse evacuation of any other kind. The discharge of the waters, the expulsion of the child and of the *placenta*, together with the lochial discharge, and the great efforts she may properly have made in the course of even a natural labour, must necessarily make a very great and immediate change in her constitution. From what does the change arise? from emptiness and fatigue. Is it possible to fix upon any better method of treatment than what would be judged right and proper under the same circumstances from any other cause? Judging from events we certainly cannot, and after seeing much practice and trying various methods, I am fully convinced that those patients will fare the best, and recover most certainly and speedily, by whom the least change from their former habits is made. Some difference of treatment must of course be required for the delicate and the robust,



robust, for the nervous and phlethoric, when there has been a long and difficult, or a short and easy labour, in a hot or cold climate, in summer or in winter, and in the same climate in particular situations. These must of course be left to the judgment of the medical attendant. But I am convinced, that the general principle of making as little change as possible, either in diet or any other respect, will best answer his expectations." 

The author speaks in strong terms of the necessity of bleeding in the puerperal fever; but, to be useful, it must be done at the very commencement of the disease. He had long entertained prejudices against this evacuation, which experience at length overcame. He is convinced that his reasoning on that head was fallacious, and his fears groundless; and that what he had considered as proofs of the insufficiency or impropriety of bleeding in the true puerperal fever, ought in reality to be attributed to the neglect of performing it in an effectual manner, at the very beginning of the disease. In short, if the first stage be suffered to pass unheeded, bleeding will certainly then be injurious, the opportunity having been lost; and the physician afterwards called in, however great his talents may be, will too often have the mortification of being a spectator of mischief which he cannot then remedy, and of an event which he can only deplore.

It is in general absolutely necessary to bleed in the beginning of the puerperal fever, and we may then avail ourselves of the advantage which this operation affords, with equal safety and propriety as in any other inflammatory disease, under other circumstances. With respect to the quantity of blood drawn, we are to be guided by the constitution of the patient and the violence of the symptoms, being cautious not to err by bleeding unnecessarily, or in taking away too large a quantity. But if benefit should be derived from the first operation, and the violence of the disease should require it, we shall be justified in repeating it at short intervals; not with a  
view



view of moderating or retarding the progress of the inflammation, but if possible of wholly suppressing it. For when the fever has remained for a very few days, the putrid symptoms advance very rapidly, and its continuance depends upon causes which cannot be removed, but will be increased by bleeding. When the attack is violent and the constitution feeble, it is always more safe and expeditiously serviceable to draw blood by scarification and cupping, or by the application of eight or ten, or even a greater number of leeches to that part of the *abdomen* which appears to be principally affected. In some countries the application of leeches to the hemorrhoidal veins has been considered as more effectual in this disease than any other mode of bleeding.

THE diseases of children, together with some further observations on the puerperal fever, will form the subject of a future volume.

ART. XL. *Philosophical Transactions, Part the First.*  
For the Year 1795.

( CONTINUED FROM PAGE 283. )

IN our last number we gave an account of Mr. Home's first paper on muscular motion. We are now to notice his second on the same subject, which was read before the Royal Society, in November, 1794. The Croonian lecture was established for the purpose of explaining, or at least throwing light on the principle of muscular motion. Many and perhaps insuperable difficulties obstruct our progress towards the attainment of this object. Indeed this was taking up the subject at the wrong end. Whilst we possessed so scanty a store of facts, and were so unacquainted with the circumstances attending the exertion of muscular power, it was futile and vain to attempt to investigate its principle. We find, accordingly, that the ablest anatomists and physiologists have been led to deviate from the

the original intention of the founder of this lecture; and, instead of attempting an investigation of the principle, to explain the anatomical structure, and various phenomena of muscles with which they were acquainted; and by this means furnish data for future inquiries.

The immediate subject of the present paper is an attempt to explain the optical adjustment of the eye to different distances. The muscularity of the crystalline humour, and the elongation of the whole organ by the joint action of its muscles, have been held forth with considerable probability, as sufficient for that purpose. The progress Mr. Hunter had made in this investigation enabled him to prove the crystalline humour of the eye to be laminated, and the laminæ to be composed of fibres; but the use to which these fibres are applied in the œconomy of the eye he had not ascertained, although several experiments were instituted with that view: his opinion, however, was in favour of their being muscular, for the purpose of adjusting the eye to different distances, by their contraction and relaxation. Mr. Home has pursued the subject in the present lecture, by a general attention to all the circumstances; but his experiments tend chiefly to indicate the change which the cornea undergoes during this adjustment. In prosecuting this enquiry, Mr. H. had the assistance of Mr. Ramsden, whose abilities and peculiar attention to optical subjects are well known.

Several experiments, made on the eye of an intelligent patient, from which the crystalline humour had been extracted, proved that the eye, when deprived of this humour, had still a power of adjusting itself to different distances; it even appeared, that the range of adjustment of the imperfect eye, when the two eyes were made to see at nearly the same focal distance, exceeded that of the perfect eye, or at least equalled it. As the adjustment of the eye was, by these experiments, proved not to reside in the crystalline, a set of experiments was instituted, for the purpose of ascertaining



taining how far a change of figure, in the cornea, might be adequate to this effect. In the first place Mr. Home ascertained, by trial on the cornea, taken from the eye of a person, of forty years of age, two days after death, that it possesses considerable elasticity, so as to be capable of having its diameter elongated by fully one-eleventh part; and by dissection he found, that the insertion of the tendons of the four straight muscles of the eye is so near the cornea, that they are not attached to the sclerotic coat, until within one-eighth of an inch distance from the edge of the cornea. He also found, that the cornea is composed of two laminæ, the external being a continuation of the tendons of the four straight muscles, giving it the appearance of a central tendon, the other a continuation of the sclerotic coat. The cornea is thickest near the axis of the eye, at which place also it yields the most by its elasticity.

Opticians will easily conceive, that the figure of this lens must therefore be changed by the action of the straight muscles. But it undoubtedly was a desideratum, to ascertain the actual production of this event in the living subject. Mr. Ramsden contrived an apparatus for this purpose; it consisted of a board with an aperture; against the upper and lower parts of which the individual could rest his forehead and chin, while the cheek was applied to one of the sides. A microscope was fixed on the outside of the board, and so placed as to take into its field the lateral part of the front of the cornea, which projects beyond the eye-lids. And, lastly, a plate of brass was so adjusted before the eye, that a distant object was seen through a small hole drilled in the same. The distance of the plate of brass being about six inches, the hole itself served as the near object. In this way it was clearly ascertained, that the cornea is more convex when a near than when a distant object is viewed. The extreme difference, measured in the direction of the axis of the eye, was about one eighth hundredth part of an inch, a space very distinctly measurable in a microscope magnifying thirty times.

From

From the different experiments the author concludes.

1. That the eye has a power of adjusting itself to different distances when deprived of the crystalline lens; and therefore the fibrous and laminated structure of that lens is not intended to alter its form, but to prevent reflections in the passage of the rays through the surfaces of media of different densities, and to correct spherical aberration.

2. That the cornea is made up of laminæ; that it is elastic, and when stretched, is capable of being elongated one-eleventh part of its diameter, contracting to its former length immediately upon being left to itself.

3. That the tendons of the four straight muscles of the eye are continued on to the edge of the cornea, and terminate, or are inserted, in its external lamina; their action will therefore extend to the edge of the cornea.

4. That in changing the focus of the eye from seeing with parallel rays to a near distance, there is a visible alteration produced in the figure of the cornea, rendering it more convex; and when the eye is again adapted to parallel rays, the alteration by which the cornea is brought back to its former state is equally visible.

‘ Having supported these facts by the evidence of anatomical structure, and absolute demonstration, I shall consider them to be established; and make some observations upon the muscular and elastic power by which so very curious an effect as the adjustment of the eye is produced.

‘ The four straight muscles of the eye are attached to the bottom of the bony orbit near the foramen opticum; they become broader as they pass forward, and when arrived at the anterior part of the eye-ball, are insensibly changed for tendons; these adhere to the sclerotic coat, and terminate in the external lamina of the cornea, which appears to be a continuation of them.

‘ When we consider the situation of these muscles, it is evident that their action will produce three very different effects upon the eye, according to circumstances. When they act separately, they will move the eye in  
different



different directions ; when together, with only a small quantity of contraction, they will steady the eye-ball ; and when this is increased they will compress the lateral and posterior parts of the eye. This compression of the eye will force the aqueous humour forwards against the centre of the cornea, while the circumference is steadied by the muscles, so that the radius of curvature of the cornea will be rendered shorter, and its distance from the retina increased.

‘ That the eye-ball cannot be made to recede in the orbit by any of these actions, is sufficiently proved by its not having done so in any of the experiments.

‘ These muscles are uncommonly large, and come much further forward than appears necessary for the purposes generally assigned to them ; but when applied to so important an office as that we have just stated, their size, and anterior insertion, are easily explained.

‘ It may be imagined that I have allotted to these muscles a greater variety of uses than is compatible with the simplicity of the general laws of the animal œconomy ; but to prove this not to be the case, I shall only bring the biceps flexor cubiti as an instance of a similar kind. That muscle is attached to the scapula by both its heads, one of which passes through the joint of the shoulder ; they afterwards unite, and their common tendon is inserted into the radius ; when the muscle contracts, the first effects will be to steady the joint of the shoulder ; if the contraction is increased, it will rotate the radius, and if still more increased, bend the forearm.

“ There are many instances in animal bodies of elasticity being substituted for muscular action, but this in the eye is by much the most beautiful of those applications.

‘ In the vascular system the arteries are composed of muscular fibres, and an elastic substance ; in the natural easy state of circulation, the re-action in the larger vessels are principally the effect of elasticity, but when increased, it is the effect of muscular contraction.

The

• The claws of the lion are drawn up, and supported from the ground, by means of elastic ligaments ; but they are brought down for use, which is an action not of often required, by muscles.

• In the adjustment of the eye it is the same ; the state fitted for parallel rays is the effect of elasticity, but that for nearer distances, which is less frequently wanted, is the effect of muscular action.

• In these different instances, the intention is uniformly to avoid the expence of muscular action whenever the effect can be produced in any other way, as muscular actions consume a considerable quantity of blood, which is the nourishment of the body.

• That the adjusting the eye to near distances is the effect of an action, or exertion, was very evident to every gentleman concerned in these experiments. In changing the focus of our eyes we were much astonished, particularly Sir Henry Englefield, who was present ; at the exertion required to adjust the eye to the near distances, and the facility with which it was adapted to distant ones ; the first was a strain upon the eye, the second appeared a relief to it.

• When the eye was intent upon the near object, it required the attention to be constantly kept up, or the subject became indistinct ; and if we looked at it beyond a certain time the eye was so much fatigued as to lose it at intervals. This corresponds with other muscular actions, for whenever muscles are kept long in one state they begin to vibrate involuntarily.

• These circumstances explain what may be called a *coup d'œil*, or the distinctness with which an object is seen when the eye is first fixed upon it. This arises from the nice adjustment produced by the muscles when first thrown into action, which they cannot keep up, being unable to remain long in the same state ; nor can they, after having been used for any time, return to this adjustment with the same exactness.

• The change that takes place in the eye at an advanced period of life, by which it loses its adjustment to  
very



very near, and very distant objects, does not arise from any defect in the muscles, as might at first be imagined, since that would not account for the eye being unable to see with parallel rays; nor is there any obvious reason why these muscles should lose their powers, while others, which are not apparently so strong, if we may judge by their effects, retain their full action long after the eye has undergone this change.

‘ This defect in the eye, I am led to believe, is brought on by the cornea losing its elasticity, as we advance in life, neither contracting nor being elongated to its usual extent, but remaining in a middle state. That elastic substances in the body do undergo such a change may be well illustrated in the vascular system. The aorta is composed almost entirely of elastic substance, and there is probably no part of the body, at an advanced age, which is so often found to have lost its natural action; it appears to undergo a change from age alone, becoming in-elastic, and then taking on diseases of different kinds, as being ossified, or becoming aneurismal; but in neither of these diseases it is found to be contracted, although often the reverse; and when disease has not supervened, the artery more commonly remains in the middle state.

‘ The cornea having similar properties must be liable to a similar change, but its action being less constant, and the power which it is to resist being weaker, the change will probably be more gradual, and less in degree, but sufficient to account for the alteration we find in the focus of the eyes of old people.’

There are many other circumstances, Mr. Home observes, respecting vision, and which may occur in disease, that may be explained by a knowledge of these facts: but the present lecture was only intended to establish the facts themselves. At a future period he promises to consider their application to the phenomena of vision, in health and in disease.

*An experimental Enquiry concerning the Reproduction of Nerves.* By J. HAIGHTON, M. D. Read February the 26th, 1795. — Dr. Haighton probably knew nothing of the experiments of Mr. Cruikshank, in proof of the reproduction of nerves, as related in our last number, or he would have noticed them, having been made so long prior to his own. The fact of reproduction, however, came out under a course of experiments, instituted for a very different purpose by Mr. Cruikshank. The analogy of fractured bones and tendons leads us, *a priori*, to suppose that a renovation of the substance of a nerve might also take place. With respect to this, it has been both affirmed and denied: some affirm, that the new-formed substance possesses the characters of the original nerve; whilst others maintain, that it is totally different: and both pretend to found their opinions on experiment.

Dr. Haighton very properly rejects the appeal to dissection, as a test of the identity of the newly-formed with the original substance. Anatomy is certainly not competent to determine what is the precise structure of nerves, what are the nature and characters of the ultimate nervous fibrils, or by what mechanism or power they execute their allotted function. Declining therefore an appeal so undecisive, he sought a test less doubtful and fallacious: as such a test was not to be found within the pale of anatomy, he resolved to try whether the resources of physiology could furnish him with what he wished.

‘ From physiology we learn, that if the action of a nerve be suspended by a division of it, and if that action be recovered in consequence of an union of its divided extremities, such medium of union must possess the characters and properties of nerve. I had therefore only to determine, what nerves appeared the most favourable for the experiments, and pursue the position first stated to its ultimate consequence. I know not if my choice was judicious, but I determined on the eighth pair.

‘ The



• The first step I took in this inquiry, was to ascertain *what effects will arise from the division of both these nerves, together with that branch of the great sympathetic nerve, accompanying and strongly adhering to them.*

• A dog being properly secured, and a convenient incision made on the forepart of the neck, I divided both the nerves of the eighth pair: he became immediately restless and uneasy, betraying symptoms of great distress upon the stomach, which continued eight hours, when he died.

• Though the result of this experiment is perfectly agreeable to what other experimental physiologists have stated, I thought it of importance to the present inquiry, to give confirmation by further experiment. I therefore repeated it on two other dogs, one of which survived three days, the other only two.

• From these experiments we learn, that the action of these nerves was suspended, and that those vital organs, which received their nervous energy from this source, had their functions arrested, so that death followed as a necessary consequence.

• It may be said here, by way of objection, that a violent shock had been suddenly given to the machine; and that the animal perished rather from the sudden deprivation of the nervous influence, than from its absolute loss; and that if the same quantity had been abstracted in a more gradual way, the animal might have survived it. How little validity there would be in such an objection the following experiment will evince.

• Another dog being procured, I divided only one of the nerves of the eighth pair. I was surprised to see how slightly he was affected from it; for, excepting a little moroseness, there was scarcely any alteration perceptible, so that within a few hours after the operation he took food as usual. On the third day, I divided the other nerve; but the same symptoms immediately supervened here as followed the division of both nerves in the former experiments: he continued in a state of



restlessness and anxiety, with palpitations and tremors, until the fourth day, when he died.

‘ The event of this experiment differs in nothing from the former, than that the fate of the animal was suspended a little longer, but the ultimate effect was exactly the same; therefore, in the first experiment, *the death of the animal is not to be imputed to the mere sudden deprivation of nervous energy*, but to its absolute loss.

‘ Wishing next to determine whether, by lengthening the interval between the division of the two nerves, a few days more, the life of the animal could not be protracted to a greater length, or even saved, I made another experiment.

‘ Having divided one of the nerves of the eighth pair, and waited the lapse of nine days, I divided the other. The same symptoms came on now as in the last experiment, but scarcely so violent. The only kind of food he would take was milk, and that in small quantities; and this always produced great uneasiness at the stomach, with symptoms of indigestion. In this state he continued thirteen days, and then died, very much emaciated.

‘ From this dog having lingered so long, I was beginning to entertain hopes of his recovery; and had that eventually happened, I doubt much whether, even under the present uncertainty of things, I could have resisted the temptation of ascribing such recovery to the reproduction of the nerves; but the event put a stop to my speculation.

‘ I think I have now proved my first position, (viz.) that whether the eighth pair of nerves be divided in immediate succession, so as to deprive an animal of their influence suddenly, or whether this deprivation be effected in a more gradual way, the consequences are, in the end, equally fatal. I must next endeavour to avail myself of this fact in the solution of the problem now before me. If the substance of nerve be reproduced, certainly a period longer than the above must be necessary for this process; but to mark the precise point of time when the line is to be drawn, would require the sacrifice of more animals than a question of mere curiosity could justify.



justify. I must, therefore, content myself with giving a general answer to the question, and inquire whether, by suspending the division of the second nerve for a much greater length of time than was done in the two last experiments, the existence of the animal could be preserved.

‘ Another dog being procured, and one of the nerves of the eighth pair divided, I allowed six weeks to elapse before the other was cut through. This division of the corresponding nerve evidently deranged him; but in a much less degree than in the former experiments. For some days he refused solid food, but took milk; afterwards he ate solid food in small quantities; and near a month had passed away before he fed as usual. The actions of the stomach were for a long time evidently deranged, so that he was continually harraffed with symptoms of indigestion; and six months had nearly elapsed before he recovered health, though during five months of the time he took his usual quantity of food.

‘ Now, to what cause are we to impute his recovery? The most probable one appears to be, that in the interval of six weeks the first nerve had been reproduced; so that the actions of those organs, depending upon this nerve, though somewhat disturbed, were not suspended. But as the union of the second nerve advanced, and the reproduction of the first became more perfect, the vital organs gradually recovered their healthy state.

‘ I kept this animal nineteen months, during the greatest part of which time he performed the office of a yard dog. And here it may be proper to observe, that in all the experiments, the voice was totally lost on the division of the second nerve. This effect anatomists will easily understand, from recollecting that the recurrent branches of the eighth pair, which are the true vocal nerves, originate below the part where the trunks of the eighth pair were cut through; consequently those nerves are themselves, in effect, divided. Now it deserves to be remarked, that his voice returned in proportion as his general health improved; and in about six

months he could bark as strongly as before, but the pitch of his voice was evidently raised.

‘ From this experiment, I am strongly inclined to believe, that there must have been a true reproduction of the nerve; yet I do not contend, that if the part of union were examined by an anatomical eye, such reproduction would be very evident. On the contrary, I am persuaded that anatomy can determine only the presence and existence of an uniting medium; but it is the province of physiology to decide whether the medium of union possess the characters, and perform the function, of the original nerve.

‘ The evidence of reproduction, as resting on this experiment, may not be sufficient to obviate certain doubts, which reflections upon this subject may probably suggest. There is a difficulty which naturally presents itself here, and this is the possibility of the stomach and vocal organs having received an additional supply of nervous energy from another source. And to give an appearance of validity to this objection, it may be said that the eighth pair of nerves communicates energy to the larynx, by means of the laryngeal branch; and that this branch arises from the trunk, above the part where the division was made, and consequently its function received no interruption from the experiment. Again, with regard to the stomach, another apparent objection offers. This organ receives nerves from the great sympathetic, as well as the eighth pair; and nothing hitherto advanced has tended to disprove, that the defect of nervous influence, from the division of the latter, has been supplied by greater exertions of the former. Lastly, the familiar analogy of the vascular system, where collateral branches are enlarged from the obliteration of a principal trunk, tend further to give weight to these doubts.

‘ To remove these seeming difficulties, by anatomical investigation, or by directing my views to any changes that might be induced on the anastomosing nervous filaments, would be an undertaking, not less tedious in its execution than unsatisfactory in its result; for there  
would



would still remain room for opposite opinions : and while some would argue that these anastomosing filaments were become evidently enlarged, others would contend that they had not suffered the slightest change.

‘ Now, I have already expressed my distrust of those decisions which are founded on an appeal to the eye, seeing that anatomy has yet to explain by what mechanism or structure these organs perform their office ; and because I have frequently heard opposite opinions on my own preparations. I therefore prefer an appeal to the functions of these parts, and inquire whether, in the experiment in which the dog survived the division of the second nerve of the eighth pair, after an interval of six weeks, it was effected by the reproduction of the first divided nerve, or in another way ?

‘ There are only two possible answers to such a question ; these are, that either the functions of the stomach, larynx, &c. were carried on by anastomosing nerves ; or that the united nerves had recovered their original importance.

‘ If the first be contended for, this consequence ought to ensue, (viz.) that the eighth pair should now be intirely uselefs, and both of them may be divided a second time, without injuring any of the functions of the animal.

‘ If the last be granted, it must of necessity follow, that the medium of union possessed the same properties as the original nerve.

‘ I have now circumscribed the field of inquiry, and have drawn the question into so narrow a compass, that it is in the power of a single experiment to prove either the affirmative or the negative. If now the eighth pair be divided a second time in immediate succession, and the animal sustain it with impunity, I conceive it right to conclude, that the actions of those organs, which originally were carried on through the means of the eighth pair, are now performed by other channels, and that the true substance of the nerve is not reproduced. But on the contrary, if the animal die in consequence of it, then I think it equally just to infer, that the new formed  
substance

substance is really and truly *nerve*, because we know of no other substance which can perform the office of nerve. I shall rely then upon the following, and consider it as my *experimentum crucis*.

‘ Having the dog in my possession upon which I divided the eighth pair of nerves nineteen months before, I cut through both of them now, in immediate succession. The usual symptoms were immediately induced, and continued until the second day, when he died.

‘ After death I carefully dissected out these nerves, and have preserved them as evidences of my success. I think I have now answered the question I proposed to myself, and can affirm, that nerves are not capable of being united when divided, but that *the new formed substance is really and truly nerve.*’

ART. XLI. *An Essay on the Causes and Phenomena of Animal Life.* By JOHN HERDMAN, Surgeon in Leith. — 8vo. 326 pa. price 3s. 6d. — JOHNSON. London, 1795.

IT is a fact, the author of this essay observes, which is indisputable, that the new system of medicine, introduced by the late Dr. John Brown, has produced a more remarkable revolution, both in the theoretical and practical departments of this branch of science than is to be found throughout the whole history of medicine. Under all the former doctrines of this art, and under almost every modification of disease, we find an universal sameness in the method of cure. Bleeding, purging, vomiting, and every other mode of evacuation, were indiscriminately applied in almost every disease; and even in those cases in which stimulants were employed, or an invigorating plan of cure pursued, these were frequently alternated with evacuants, as if certain diseases could not be eradicated, except by the opposite means of inducing debility and vigour at the same time in the body



The practice, founded on the new theory, in one respect resembles the old, as the same method of cure is employed in the far greater number of diseases. The old theorists universally applied evacuants, and endeavoured to debilitate the system by every means. The application of stimulants is nearly as universal, on the principles of the new theory. According to the assertion of its author, this plan of cure ought to be employed in the proportion of ninety-seven diseases in the hundred. If this opinion is founded in the nature of things, what havock must have been produced by the opposite method, during the course of two thousand years.

It is, however, to be feared, Mr. Heardman remarks, upon a moderate calculation, both the beneficial and pernicious tendency of either mode of practice is nearly in an equal ratio, in proportion to the time of their respective reigns. Mankind hitherto have had a wonderful tendency towards rushing into extremes. In no case, perhaps, is this fact more fully exemplified than in the instance now before us: For if (as has been asserted) the practice under the old theories has had a tendency more frequently to produce death than to cure disease, it is still perhaps problematical, whether that of more modern date does not, in many instances, produce the same effect, by employing an opposite cause. For there is reason to believe, that this practice has been carried to the extreme, by those who are acquainted with the principles upon which it is founded, and also by those who are guided merely by the universal principle of imitation. The method, however, which the author of it adopted, for analyzing the healing art, has been found of the utmost importance for prosecuting discoveries in every other branch of science; and there are good grounds to hope, that by still pursuing the same plan with caution, medicine will progressively become a most valuable acquisition to society.

The general purpose of the present work is, to state the causes and phenomena of animal life, and the various changes to which the body is liable, by the increased or diminished

diminished action of those powers which produce life; or of others, to the operation of which the animal body may be subjected. Having given a definition of life, as consisting in a peculiar organization, acted upon by external stimuli, he proceeds to take a brief view of the structure of the animal body, chiefly with the design of shewing, that a similar organization, under various modifications, takes place in every part. Secondly, that by the union of the various parts of the animal body, a complete and indivisible whole is formed, so that any agent, which operates on a particular part, must, in a greater or lesser degree, affect the whole. Thirdly, he offers some general observations on the nature of excitability, or that principle which appears to exist in every part of the body; and by which it is rendered susceptible of the action of various agents. And, lastly, he particularizes those agents, by the operation of which, upon organized matter, the phenomena of life are produced and continued.

The effects produced by the application of external agents, or stimuli, are said to depend on the 'state of the organization of the body or part to which they are applied.' This state is liable to frequent and considerable variations. Thus, in paralysis, when the application of the usual exciting powers is found to produce no effect, this is attributed to a change in the organization of the part, by which it is rendered incapable of being acted upon by the natural stimuli. The introduction of new terms here is certainly of no advantage, for they express no more than the common and well understood language — *loss of sensibility* or of *irritability*. The expression, therefore, *change of organization*, explains nothing of the nature of such alteration, and is merely a convertible term with *want of excitability*.

Infancy is said to be distinguished by a *weak* and *delicate* organization; and that this weak state of the animal fibre renders it impossible to produce, in the infant system, vigour of body, or that state which has been termed high excitement. There seems here a  
misapplication



misapplication of the term *weakness*. Undoubtedly it would be absurd to expect the same degree of muscular strength in an infant as in the adult: yet, in strictness it can hardly be said, that infancy is a state of weakness. Strength is a relative term, expressive of the perfect performance of the functions of the particular animal; which can take place as fully in the infant state as in the adult; and whilst the former is enabled to perform well its natural actions of nutrition, growth, &c. however different the powers it exerts may be, from those of the adult, there appears no more reason for terming such state a state of weakness, than there would be for saying, that the living powers of the horse were superior to those of man, because he could exert, by his muscles, a greater mechanical force. We cannot, therefore, with the author, admit, that the excitement, or effect produced by the exciting powers, on the body, is necessarily greater in the adult than in the infant state; or that greater vigour can take place in the former than in the latter. A high degree of excitement we conceive to consist in the perfect performance of all the functions; and we have no idea of a degree of general excitement which exceeds this.

Although the present essay may be considered as, in general, confirming and illustrating the Brunonian doctrines; yet it differs from these in several material points; and in none more than in the attempt to shew, that there is no foundation for the distinction Dr. Brown had made, between indirect and direct debility; and that the practice, arising from such distinction, is erroneous and hurtful. This point the author discusses as follows:

‘ Let us here take for our example, a person arrived at the age of manhood, and possessing a vigorous constitution, the various natural or healthful agents acting upon him, and employed in a due or moderate proportion: in this case, we observe all the animal functions duly performed, and the vigour of the body carried

ried to its utmost height. This is the highest state of excitement of which the system is capable : or in other words, the organization is now in its most perfect state. We may next consider what will be the effects of abstracting, or employing in too great proportion, the natural stimuli.

‘ If the natural stimuli are abstracted in any degree, a proportional degree of weakness will be produced in the system. This is perfectly obvious, if the natural stimuli of heat or aliment are withdrawn in any considerable proportion. The organization is evidently debilitated ; — the powers of life or excitement are diminished ; and, it would seem, the excitability is augmented in an equal ratio. That the powers of life are diminished, will not be disputed : And the seeming proportional increase of the excitability, appears to be proved by a great number of facts. If a person has fasted long, a small proportion of any of the natural stimuli will produce a much greater effect upon the system than a larger quantity would have done, if the body had not been debilitated by the abstraction of the usual stimuli. The stimulus then, in this case, seems to have a much greater effect than it would have had if similar agents had been regularly applied to the body. Again, when the attraction of the usual stimuli has been carried to a very considerable extent, as when a person is nearly famished, a very small proportion of a mild substance, as a few spoonfuls of broth, if hastily swallowed, will produce the same effects as a strong stimulant, such as alcohol would have done, if the organization had not been thus debilitated. The mild stimulus will, in this case, produce the usual exhilarating effects of spirituous liquors ; and instances have even been known, in which a small quantity of broth has produced death, in the same manner as a large quantity of alcohol would have done in a system not debilitated by the abstraction of the usual stimuli. These effects sufficiently shew, that in that state of weakness, which is induced by the abstraction of the necessary agents, the organization is  
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more easily excited to action, than in the healthful state; and hence it is has been supposed, that excitability is accumulated. It is, however, perfectly clear, that the abstraction of one or more of the necessary or usual stimuli will produce a derangement of the organization, which is uniformly marked by debility. But the derangement to which the organization is liable, may be varied in several ways, according to the nature and use of the stimulus, and the proportion in which it is abstracted, so as to produce, no doubt, several very different modifications of the animal fibre. The effects produced on the body, by the abstraction of different stimuli, we shall state more particularly when treating upon the agents: at present it is sufficient to observe, that by the abstraction of aliment, the organization is debilitated, because the animal fibre has not received that accession of new matter, which is necessary to preserve it in the healthful state. By the abstraction of heat, i. e. when the body is placed in a low temperature, as at  $32^{\circ}$  or under, the animal heat is carried off in a greater proportion than that in which it is produced in the body; and the animal fibre, deprived of the necessary quantity of this stimulus, appears to be incapable of performing its usual functions. Upon similar principles, we may explain the cause of the derangement of the organization from the abstraction of several other of the healthful agents. But it must be confessed, that the mode in which some of these agents operate, and by which they assist in preserving the body in the healthful state, have hitherto eluded the researches of all physiologists. The fact however is plain, that the abstraction in any degree of all or any of those powers which are necessary to the production and continuance of the phenomena of life, induces a debilitated organization; and the body thus weakened, appears to become more susceptible of the action of these or other agents.

‘ Upon the other hand, the organization of the same person, or of another of an equally vigorous constitution, may as easily be deranged by the same agents acting in



too high a degree. Thus too large a quantity of aliment will, in a certain period, produce debility. The same effect more rapidly follows too free a use of the artificial stimulants, as alcohol, or any substance containing it. And if the total abstraction of the healthful agents will quickly annihilate the excitement, or destroy life; so also the same agents, operating in an extreme degree, and more especially the artificial stimuli, will quickly so much derange the organization, that the animal functions can no longer be carried on.

There is, however, a material difference in the first effects produced on the body in these two cases, although they both terminate by producing a debilitated organization, which seem in no respect to differ. A small abstraction of the natural agents produces a slow, and, perhaps, for some time, an almost imperceptible waste of the system; and the animal fibre is gradually debilitated. A small increase beyond the due proportion of the healthful agents, or a moderate use of the artificial stimuli, causes, for a short period, an increased vigour of body; and, in most instances, an increased accession of matter to the system. But if the practice is continued, and more especially if the excess of stimulus is increased, a debilitated organization infallibly ensues. In the final effects arising from these two opposite causes, we perceive no difference. By the first, debility may slowly commence, and gradually increase, in proportion to the degree in which the necessary agents are abstracted, till, if not prevented by the proper remedies, the organization is totally deranged, and death follows: and during the progress of this debilitated state, from the increased weakness, the body becomes daily more susceptible of the action of stimuli. By the second, a degree of vigour in the organization is certainly, in the first instance, produced, but by the continued action of too powerful stimuli, the organization becomes deranged, debility ensues, and the system, as in the former case, becomes daily more susceptible of the action of stimuli. The states of direct and indirect debility, as they have been called,



called, when the latter is fully established, appear not to differ in their nature. And hence it seems a fair conclusion, that the method of cure, in both cases, ought to be the same.

‘ That the debility induced by the action of too powerful stimuli, differs not from that which follows the abstraction of the necessary agents, may be further proved, by the well-known effects of the more powerful artificial stimuli. We have already hinted at this, and may here farther observe, that we perceive no accumulation of the excitability when a person is indulging in strong liquors, even to intoxication. But no sooner has the operation of the stimulant ceased, than we perceive a debilitated organization, in proportion to the excess in which the stimulus has been employed ; and this debility is uniformly accompanied with a higher susceptibility of the action of stimuli. It does not, therefore, seem true, in fact, that the debility which follows the excessive use of stimulants arises from an exhaustion of the excitability. It is true, that an extreme dose of alcohol or other stimulants, will at once destroy the excitability and excitement ; but the same effect will follow from the total abstraction of the healthful agents. In almost all cases the debility induced by the excessive action of stimuli, is certainly accompanied with a greater susceptibility of the action even of the stimulant which has produced the debility. It must, however, be admitted, that opium furnishes a contrary example ; for as far, we believe, as observation has hitherto gone, it appears, that in the continued use of this drug, an increased dose will always be necessary to produce the usual degree of excitement. Yet, even in this case, it is certain, that a constitution debilitated by the use of opium, acquires an increased susceptibility to the action of other stronger stimuli, and the only conclusion that we can rationally draw from the fact, that the dose of opium must be perpetually increased, is, that various stimuli differ, not only in their degree, but also in their mode of operation.’

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In conformity to the idea of debility above stated, the author forms his plan of cure. As the natural effect, he observes, of all stimuli, and even of the mildest healthful agents, is ultimately to derange and debilitate the organization, it seems obvious, that such debility cannot be removed, but must be increased, by a free use of powerful stimulants. The natural method of removing debility, in every case, is by employing in due proportion, the necessary healthful agents, particularly aliments.

There is certainly much of truth in this mode of reasoning, but experience seems to point out, that there is a real ground of difference in the treatment of debility, as arising from one or the other of the sources above pointed out. A large field is still open on this subject for the exercise of observation and inquiry.

We must not omit the following very ingenious refutation of the opinion which has been adopted by some, that of attributing the excitability of animal bodies to the presence of oxygene in the animal fibre. This idea has been principally supported by Dr. Girtanner, who has attempted to prove, that the excitability of the animal system, which he styles irritability, is entirely owing to the presence of oxygene: or, in other words, he asserts, that oxygene is the principle of irritability. By the accumulation or exhaustion of this substance, he endeavours to explain the mode in which the various agents act upon the body. He has indeed almost solely applied his reasoning to the muscular fibre, which, in his opinion, becomes more or less irritable, in proportion to the quantity of oxygene contained in the system: in short, all the phenomena of life appear to depend upon the presence of this substance. Oxygene, then, with Girtanner, supplies the place of the vital principle, the *archæus*, the animal soul, or the *vis medicatrix naturæ* of former theorists. The new theory has indeed this advantage over the old, that, instead of vague and unmeaning terms, we are presented with a substance with which we are in some degree acquainted, and which really exists in or-  
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ganized matter; so that the principle of life is here attributed to something.

We may readily admit, the author observes, that many of Dr. Girtanner's experiments upon this subject are ingenious, and his reasoning frequently plausible; yet we cannot adopt his opinion: nor, in offering a sufficient refutation of it, will it be necessary to enter into a minute examination of his experiments, or the deductions which he has drawn from them. A few general observations will sufficiently evince, that his theory is not tenable. Oxygene is indeed known to be a constituent of animal bodies; and it may perhaps be received into the system in two ways, by respiration, and in the aliment. Before it is received into the body, and assimilated to the system, in whatever form it is presented, it cannot be the principle of irritability, but is one of the agents which act upon the excitable or irritable principle. After it is assimilated to the body, it forms only one of the constituents of which the organic matter consists; and it is undoubtedly the whole organic matter which is the subject of excitation, not merely one of its constituents.

But, secondly, if it is alledged that life and consequently the capacity of being excited, is taken away from organized substances, by the with-holding the necessary supply of oxygene, it must be remembered, that the same effect is produced by with-holding any other of those agents which produce and support the phenomena of life; such as heat, aliment, &c. We might therefore as well suppose that the caloric, or matter of heat, the carbone, hydrogene, or azote, which we receive in our aliment, is the excitable principle, as oxygene.

And lastly, were oxygene indeed the vital principle, the fact is not proved by those experiments which Dr. Girtanner imagines the most completely satisfactory, or by the reasonings which he seems to think absolutely decisive. He has, with some propriety, attempted to form an arrangement of the different agents which act upon the body: he has divided them into three classes. The first he supposes to have the same degree of affinity

to oxygene, or the irritable principle, as the organized fibre itself; these substances he therefore imagines produce no effect upon the fibre. The second class are those which have a less degree of affinity with oxygene, than the fibre has; and which will therefore part with oxygene, and surcharge the fibre with it: these he supposes produce an accumulation of the irritable principle; and the substances which effect this, he calls negative stimuli. The third class contains those substances which have a greater affinity to oxygene than the fibre itself has, and which will consequently deprive it of oxygene, and produce the state of exhaustion; these substances he calls positive stimuli. To this arrangement several valid objections may be made; and especially to the application which he makes of his experiments and reasonings on the two last classes, the negative and positive stimuli; in the support of the opinion that oxygene is the irritable principle. He asserts that the positive stimuli, the most powerful of which he states to be alcohol, sulphuric æther, opium, and the oleum lauro-cerasi, deprive the fibre of oxygene, by actually entering into combination with it; and he supports this opinion by chemical facts, which are in themselves no doubt perfectly just, viz. that these substances are all highly combustible; i. e. that they have a great affinity with oxygene. But from these facts he draws a conclusion which is by no means admissible, viz. that they deprive the organized fibre of its irritability, by entering into combination with the oxygene it contains. When animal life is destroyed by any of the positive stimuli, he alledges, that the irritability of the moving fibre, in every part of the system, is instantaneously taken away. But allowing this to be the fact, it is impossible, at least in many instances, that it should have been effected by the actual combination of the positive stimulus, or combustible substance, with the whole, or the major part of the oxygene contained in the body. A single drop of the oleum lauro-cerasi received into the stomach, produces immediate death. But can the most credulous believe, either that the drop of oil was in-

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stantaneously changed into so minute a state of division, as to be distributed through every part of the system; or if it had, that it could attract and be united with the whole oxygene of the body? Will chemical experiment prove this? Quite the reverse. Let us subject such a portion of the oil to combustion, let us oxygenate it in the highest possible degree, and we shall find, that the quantity of oxygene with which it will unite, will bear a very inconsiderable proportion to the quantity contained in the body of an animal, the life of which may be destroyed by a similar drop of the oil.

Upon the other hand, he supposes that the negative stimuli, as he terms them, communicate oxygene to the muscular fibre; among these he reckons many of the acids and oxydes of metals. The most powerful are consequently the oxygenated acids, and those metallic oxydes which most readily part with their oxygene. Thus the oxygenated muriatic acid; the oxygenated metallic salts, as the oxygenated muriate of mercury, and the oxydes of arsenic, mercury, and silver, he supposes, produce injurious effects in proportion to the quantity of oxygene they contain, and the facility with which they part with it. By communicating their oxygene he supposes that the muscular fibre becomes hyper-oxygenated. But here, as in the former case of the positive stimuli, the cause is by no means adequate to the supposed effect. It is indeed true, that mercurial and silver erodents destroy the organization of the part to which they are immediately applied, by their oxygene uniting with one or more of the constituents of the animal substance. But it cannot be admitted, that a few grains of the white oxyde of arsenic, or the oxygenated muriate of mercury, can possibly contain such a quantity of oxygene as will induce death by a hyper-oxygenation of the system. Dr. Girtanner's opinion of this subject is perhaps sufficiently refuted by a single fact, viz. that according to his own supposition, we receive into the body, by a few inspirations, a greater quantity of oxygene than can be contained in the small portions of the mineral poisons we have mentioned

tioned which are sufficient to produce death. Why then the author asks, is not the system hyper-oxygenated by respiration, as well as by these deleterious substances? It is in vain to reply, that the oxygene received by respiration, is only in such proportion as is immediately necessary to oxygenate the system. For the question here depends alone upon the quantity of oxygene received into the system in a given period: and it is evident that the quantity contained in such a portion of the oxyde of arsenic as will cause death, is exceedingly trifling. At any rate, a few inspirations of pure oxygenous gas ought, upon this principle, to be equally deleterious with a dose of arsenic.

The observations here offered, it is presumed, sufficiently prove, that in his attempt to detect the principle of irritability, Dr. Girtanner has not been more successful than his predecessors.

ART. XLII. *A Copy of the Appendix and Notes, annexed to the 3d Edition of Remarks on the Ophthalmy, Psoropthalmy, and purulent Eye.* By JAMES WARE, Surgeon. — 8vo. 32 pa. price 1s. — DILLY. London, 1795.

THE separate publication of this appendix and notes, was, we presume, intended for the accommodation of those purchasers, who were in possession of the former editions of the author's treatise on the ophthalmy, &c. The appendix contains brief remarks on a species of ophthalmy, which is usually accompanied with much debility, together with the description of a case of this kind, which was cured by a fumigation of eyebright and plantain leaves. The case is as follows:

A lady about 55 years of age, in the year 1787, was attacked with a severe pain in the head, for which, after having used a variety of remedies without success, she was recommended to try the effects of sea air and sea bathing. But she had not been many days on the sea coast, before an inflammation began in both her eyes; and



and this rapidly increasing, she soon returned to London for the aid of medical advice. She was here confined to a dark room several weeks; and when the inflammation abated, she was distressed by the imaginary appearance of a considerable number of black moats or marks, (usually called *muscæ volitantes*) which constantly moved before her eyes. In about six weeks the inflammation was subdued, and the lady recovered her usual sight; but the *muscæ volitantes* remained, and were particularly troublesome when the light was strong. She suffered no other inconvenience, however, from her eyes until the year 1793; when the left eye became again inflamed, but without giving her pain; and, in addition to the appearances above described, the sight of this eye became obscured with a thick mist. With a view to remove the inflammation she was bled with leaches on the temple, had a blister applied to her back, and took some strongly purgative medicines; after which, by the advice of a gentleman of eminence in the profession, she began to take a solution of the *hydrargyrus muriatus*, (which was given her once or twice every day) and to make use of a yellow snuff, which appears to have contained a considerable proportion of the *hydrargyrus vitriolatus*. At the same time a variety of lotions were applied in succession to the eyes themselves. These remedies were steadily continued several weeks; but, under the use of them, the dimness in the sight of the left eye greatly increased, and at length the patient was unable to distinguish with it any object whatever. The sight of the right eye, which had hitherto continued good, with the exception of the *muscæ volitantes*, began now to be affected, precisely in the same manner in which the other eye had been first attacked. In this period of the disorder, I was first desired to visit the lady; and I met, in consultation, Dr. Grieve of Norfolk-street, and Mr. Thomson, surgeon, at Woodford. Many of the blood vessels of both eyes, and particularly of the left, were at this time much enlarged; but the appearance they made was very different from that of a common ophthalmy,



the eyelids as well as the eyes having a peculiarly dry but relaxed look, and both being wholly free from pain. The left cornea had a deeply opaque spot in its inferior part, and a dulness over its whole extent; but the greater part of the pupil was perfectly visible, and the dulness in its appearance was sufficient to account for the total loss of sight in this eye. The right cornea had a similar dull look, but there was no defined opacity on one part more than another. Both pupils were of the size which they usually have in a moderate light, and did not retain the smallest degree of power to dilate or contract. The near prospect of total blindness had not only much hurt the lady's spirits, but, joined with the weakening power of the medicines she had taken, had produced a considerable degree of general debility. Strengthening remedies were administered internally; and a lotion composed of æther and a weak solution of hydrargyrus muriatus, agreeably to the prescription mentioned in the foregoing case, was recommended to be applied to both the eyes, three or four times every day. These medicines, however, producing no sensible amendment were in a short time wholly omitted; and in their stead, the use of a fume, produced by burning a mixture of three parts of the herb eyebright, and one part plantain leaves was adopted. It was applied about five minutes daily to each eye, by means of a machine, somewhat similar to that with which the fume of tobacco is injected in disorders of the primæ viæ. Internal medicines of all kinds were omitted, during its use, except a cup full of the infusion of eyebright, which the patient drank every morning fasting. For a short time, a small proportion of tobacco was mixed with the eyebright and plantain; but the tobacco was soon left out, being found to stimulate the eyes too powerfully. The immediate effect produced by the fumigation on the eye was that of a mild stimulus, by which means, was excited for a short time, a considerable flow of tears; but these soon ceased, and the eye always felt afterwards both lighter and easier. It was steadily continued two months before any considerable amendment



ment took place in the patient's sight. The eye, last attacked, was the first to experience a favourable change; and in about four months she distinguished with it large letters. Eight months elapsed before the left eye began to see at all; but in twelve, without any alteration in the mode of treatment, this, like the other, recovered its perfect sight. The redness of the tunica conjunctiva had now wholly subsided; both the pupils were become clear; and their power to dilate and contract in different degrees of light returned to the state in which they usually are when the eyes are quite well.

The notes relate to the following subjects, and are classed under different heads: 1. On the ophthalmia occasioned either by warts, or by tumours of other kinds, situated upon, or within the eyelids. — 2. Of the similitude between the purulent ophthalmia in adults, and the purulent eyes of new born children. — 3. On opening the angular vein, as an occasional means of cure in a violent ophthalmia. — 4. On the œdema of the upper eyelids, which sometimes accompanies the ophthalmia. — 5. On the removal of a portion of the tunica conjunctiva from the inside of the eyelids, when they are everted and thickened. — 6. On the application of an oiled silk cap over the head in particular cases of this disorder. — 7. On the ophthalmia occasioned by affections of the stomach and bowels; — by dentition in children; — and by decayed teeth in adults. — 8. On the best mode of applying the thebaic tincture. — 9. On the efficacy of the *fotus capiti papaverum*, either alone, or mixed with brandy, in painful and relaxed cases of the ophthalmia. — 10. On the uses of small doses of opium internally, when the eyes are irritable, without much inflammation. — 11. On the efficacy of the corrosive sublimate in the intermittent ophthalmia. — 12. On opacities in the cornea without preceding inflammation; with remarks on the *gerontoxon*, vel *arcus senilis*; and on those cases, in which the cornea either assumes a conical figure, or loses part of its natural convexity. — 13. On the application of the *succus lactucae sessilis* in the chemosis. —

14. On the use of sugar in the hypopion. — 15. On the unguis vel pterygion. — 16. On the application of sea water, in chronic cases of the pforophthalmy and ophthalmy. — 17. On the use of the lunar caustic, or of the lapis infernalis, in deep ulcerations on the edges of the eyelids. — 18. On the small change sometimes made by the pforophthalmy in the appearance of the parts affected by it. — 19. On the advantage of scarifying the inside of the eyelids, in preference to the application of leeches to the temple, in the purulent eyes of new born children.

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ART. XLIII. *Medical Essays and Observations, with Disquisitions relating to the Nervous System.* By JAMES JOHNSTONE, M. D. Physician in Worcester: to which is added, *An Essay on Mineral Poisons.* By JOHN JOHNSTONE, M. B. of Birmingham. — 8vo. 368 pages, price 7s. 6d. — LONGMAN, London, 1795.

THE first essay in the present volume is on the use of the ganglions of the nerves. It was originally published in the 54th, 57th, and 60th volumes of the Philosophical Transactions, and is now re-published with additions. Having remarked that the uses of the ganglions of nerves have been hitherto not at all known, the author observes, that ganglions are almost peculiar to nerves, distributed to parts, the motions of which are totally involuntary. 1. They are observed to be seated generally upon nervous cords, formed by the union of several different nerves; and sometimes too before nervous cords send off branches. All of them except the opthalmic ganglion, (and two or three besides belonging to the fifth pair, not constantly found) either are seated upon the great sympathetic nerves, or are to be considered as their origins.

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• They appear to abound with blood vessels ; and it is observed, by *M. De Haller*, that the nervous filaments lose, in ganglions, their rectilineal parallel direction, and seem to be intimately commixed therein.

• The bulk of a ganglion constantly exceeds that of all the vessels and nerves which it receives, and of which it may seem composed. Hence we may reasonably conclude, that in ganglions, the different nervous filaments are very intimately mixed ; that a new nervous organization, or arrangement of the medulary substance, probably, takes place in them, and is subservient to some important purposes in the animal machine ; a conjecture which has the sanction of a *Winslow*. and the latest, as well as the earlier thoughts, of the great *Morgagni* in its favour, though that purpose is not pointed out by them.

• In order to determine the particular use of ganglions, (the intimate structure of which, equally, with that of the brain, and medulary substance of the nerves, we are hitherto ignorant of,) in the animal system, let us try if something tending this way may not be suggested, by reflecting on the functions and motions of the parts supplied principally by nervous cords from below the ganglions.

• The intercostal, more fitly called the great sympathetic nerves, abound most with ganglions ; and by examining what is particular and peculiar in the motions of parts to which these nerves are distributed, we shall probably be led to the uses of ganglions.

• The muscular substance of the heart has its principal, or rather all its nerves, from the intercostals, which are always detached from the principal cords below the ganglions, and chiefly from the inferior cervical ganglions. The few nervous cords from the *par vagum*, or eighth pair, which, in the human subject, are sent towards the heart, are almost totally spread upon the pericardium and great vessels.

• In the abdomen, this nerve unites with the *par vagum* of the right side, and they together form the  
great



great semilunar ganglion ; from which, and from other ganglions, formed in inferior parts of the abdomen, filaments are distributed to the intestines, the liver, the spleen, the kidneys ; and some of them descend to the fallopian tubes, uterus, and other parts in the pelvis ; some of which are also in part furnished with filaments from the lumbar nerves.

‘ The heart and intestines, being wholly supplied by nervous filaments, detached below some remarkable ganglion, we must inquire what is peculiar in the motions of these parts, or in their structure ; but the motions of the heart and intestines are remarkable, and exactly similar, in being both involuntary, or not liable to be either stopped, renewed, or in any way controlled by the will.

‘ Though it be very certain that those motions are excited in the heart, by the gentle stimulus of the blood upon the internal surface of that organ, and in the intestines by that of the secreted liquors, and of the food taken in ; of which stimuli these parts have the quickest and most exquisite perception ; yet this being ordinarily not so strong as to make us conscious of its action, much less painfully so, can hardly be supposed to render these motions quite uncontrollable by the will, without some other efficient cause.

‘ Anatomy discovers no peculiarity in the muscular structure of these parts likely to account for this ; and, excepting in their nerves, having ganglions, which seem indeed appropriated to them, no anatomical difference has been observed, no mechanism which these parts have, more than, or different from, those muscles which are subject to the will.

‘ May we not then reasonably conclude, that ganglions are the instruments by which the motions of the heart and intestines are, from the *earliest* to the *latest* periods of animal life, rendered uniformly involuntary ; and that this is *their use* ? which they subserve by a structure indeed unknown to us, (yet evidently different from that which usually obtains in nerves,) no less than that  
of



of the brain, though it seems not improbable the first may have some analogy to the last.

‘ This conclusion concerning the use of ganglions is supported by every truly parallel instance. Thus the motions of the *uvea*, or *muscular circles of the pupil* of the eye, ever contracted or dilated, as the eye is more or less irradiated with light, are as much *involuntary* as those of the heart itself, though some unnecessary distinctions have been made concerning them, of which we shall afterwards take notice; and it is known to anatomists, that the muscular fibres of the *uvea* are supplied by nerves from the *lenticular ganglion*, which seems formed solely for the use of that muscle, and for that purpose.

‘ When we consider that the nerves, which are more immediately ministerial to the soul, and convey impressions of external objects to it, have no ganglions; that they are never found upon the olfactory, optic, or auditory nerves; and that they are as rare upon the nerves instrumental in voluntary motion, as they are constant and numerous in parts whose motions are independent of our volitions; we have in this case the firmest grounds of belief that the ganglia, on the latter, are placed as checks to the powers of volition; and that the former are exempted from them, because they would have interrupted and prevented the determinations of the will from reaching the parts intended to be subject to it, and upon sensory nerves, would have rendered the notices we receive much less distinct, perfect, and acute than they ought to have been.

‘ The left nerve of the eighth pair, distributed to the stomach, and probably the cause of the distinct and exquisite sensations of that organ, and of its remarkable sympathy with the head, seems also principally concerned in transmitting the sense of hunger to the mind, and therefore may be considered as a sensory nerve. This notion seems proved by, and, in its turn, throws light upon those experiments made by celebrated anatomists, in which the eighth pair of nerves was cut asunder or tied



tied in brutes; and by which the functions of the stomach were not manifestly disordered. The latest and best anatomists agree there is no ganglion found on this nerve, between its origin and the stomach, where it is chiefly spent.

‘ If ganglions were not intended to check, and did not actually limit the powers of volition, the diaphragm had probably been entirely furnished from the intercostals, as most of the parts in the thorax above it, and in the abdomen below it. But as the motions of this muscular membrane were to be contrrollable by the will, we find peculiar nerves, namely, the phrenic, which are destitute of ganglions, sent to it from a great distance.’

Having thus stated his ideas respecting the seats and uses of ganglions, Dr. Johnstone proceeds to answer the objections which have been made to his doctrine, which he endeavours to support by experiments, and by medical and anatomical facts. The principal objection which has been offered to the opinion here entertained of the use of ganglions is, “that all the nerves sent from the spinal marrow have ganglions, where they send off the filaments which communicate with the intercostals.” But, besides that this objection is obviated by a discovery made by Dr. Monro, “that the anterior and posterior bundles, which form the spinal nerves, has each its proper hole in the spinal sheath of the dura mater; that the *posterior bundle only ends in the ganglion*, and that the anterior bundle, which does not pass through the ganglion, does not incorporate and unite with the posterior till it has passed through the ganglion,” the experiments here related prove, that the ganglions on the spinal nerves do not hinder the irritation of the spinal marrow from causing convulsions in the voluntary muscles, whilst no effect is produced, by such irritation, on the action of the heart and intestines, although, on irritating the proper nerves of the heart, below the ganglion, the action of this part is thereby excited.

The



The summary then, of Dr. Johnstone's doctrine is as follows: That the ganglions, respecting their structure may justly be considered as little brains, or germes, of the nerves detached from them, consisting of a mixture of cortical and nervous medullary substance, nourished by several small blood vessels, in which various nervous filaments are collected, and in them lose their rectilinear parallel direction, so that a new nervous organization probably takes place in them. Respecting their uses, ganglions seem the sources or immediate origins of the nerves, sent to organs moved involuntarily; and probably, the check or cause, which hinders our volitions from extending to them.

Ganglions seem analogous to the brain in their office; subordinate springs and reservoirs of nervous power, they seem capable of dispensing it, long after all communication with the brain is cut off. And though they ultimately depend upon the brain for its emanations, it appears from facts that, *that* dependence is far from being immediate and instantaneous.

From the ganglions serving as subordinate brains, it is, that the vital organs derive their nervous power, and continue to move during sleep; and, to the same cause, as well as to its greater irritability, we may refer the continuance of the motion of the heart, so much longer than that of the voluntary muscles, in perfect apoplexies. From thence too, the motions of the heart receive, for some time, support, even after the spinal marrow and intercostals, in their descent along the neck, are cut through; so that animals survive this experiment sometimes thirty hours; which, however, proves at length certainly fatal, by cutting off all communication with the prime fountain of nervous emanation.

In a word, that *ganglions* limit the exercise of the soul's authority in the animal œconomy, and put it out of our power, by a single *volition*, to stop the motions of our heart; and in one capricious instant, irrevocably to end our lives,



THE second essay is entitled *Cui Bono? Or physiological and pathological Observations on the Functions of the visceral Nerves, with some Remarks on the Action of Opium, and other vegetable Poisons*. Internal organs, the author observes, are insensible to a degree, as well as involuntary. But these parts, though they cannot be affected by volition, are nevertheless liable to be acted upon by violent passions of the mind; thus, strong affections and motions of the mind influence the secretions: terror, and hypochondriac and hysteric fits occasion a sudden flow of limpid urine: lust increases the secretion of semen: hunger, and a sight of victuals, cause saliva to flow into the mouth: tears are forced, by grief, from the lachrymal glands; and bile from the gall-ducts, agitated by violent passion. These principles are, likewise, illustrated by the diseases of the internal parts, which are often found destroyed without having previously excited any painful sensation.

The question respecting the stimulant or sedative powers of opium is here again revived. It will not be denied, the author observes, that large and poisonous doses of opium are fatal, by directly extinguishing those vital powers in the nervous system, by which they are the instruments of sensation, and of every action in the animal œconomy. The lesser doses act, in proportion to the quantity, in a similar manner to the greater doses, on the nervous system; and while the former extinguish life, the latter assuage pain, and moderate excessive and unnatural spasmodic motions, both as palliatives and remedies: and, when judiciously applied, with very salutary consequences.

Small doses lull and benumb sensation, and suspend its exercises; and, abate both the power and exercise of motion; this suspension contributes to the restoration of the nervous power, perhaps in the manner it is renewed in sleep: so that animal invigoration in this case, is not roused or exhausted by stimuli, but, by a remission of action; the proper benefit and effect of this sedative remedy, when applied with judgement. Like  
the



the power ascribed to the rod of Mercury, in the *Æneid*.

— hac animas ille revocat orco  
Pallentes, alias sub tristia Tartara mittit;  
Dat somnos, adimitque, et lumina morte resignat.

Thus opium may produce effects very different and opposite, according to the dose, and the disease and constitution of the patient. When given seasonably, and with discernment, the ease it gives is a prelude to the preservation of life, and the restoration of health: in rash, in inexperienced and unskilful hands, it is often a speedy passport to the grave.

The stimulating matter contained in a grain or two of opium, is very inconsiderable, compared to the stimulating power in pepper, and a hundred other simples, which have no such effects on animals as opium; so that the action of opium cannot be similar, or attributed to stimulus. If at any time it appears to have different powers, they are *secondary* effects, such as are consequences merely of its primary proper sedative power, acting upon the living system in various conditions, of health and disease.

‘ This medicine, Dr. Johnstone observes, having formerly been applied very perniciously, in fevers; and doctrines having been lately promulgated, which threaten a return of such abuses, I shall add a few reflections, the result of experience and observation, on the use and operation of opium.

‘ Externally applied, except in wounds, its effects are seldom very conspicuous. In glysters, its operation is hardly less powerful than in the stomach. When received into the stomach, its operation is powerful and extensive, in consequence of the sensibility and connection, the nerves of that organ have with the brain and heart, and every part of the body.

‘ By rendering us less sensible to the stimulus of ordinary sensations and of pain, the procuring sleep is one of its earliest consequences, that is a temporary suspension of the functions of sensation and voluntary motion, takes place, In the vital functions, the heart becomes

becomes less sensible to the stimulus of the blood, and its motions, and the pulsations of the arteries, with respiration, are rendered sensibly slower, and the pulses thereby fuller.

• Its powers, of lessening the irritability and activity of the alimentary canal, and, of diminishing and suspending every evacuation, that of sweating alone excepted, are well ascertained. As it is certain, an increased dose ends in the extinction of every animal function, it is evident that the proper operation of opium, whether in small or greater doses, is uniformly sedative, and that by this power, health may be restored, and life extinguished.

• The resistance given by the vital parts, to whatever tends to their extinction, occasions secondary effects, which have been mistaken for the direct consequences of the primary powers of opium. This has occasioned an error, of particular importance, by which a stimulating, and *direct* strengthening power, has been attributed to opium, as well as its proper sedative power. The struggles of the vis-conservatrix naturæ, to resist powers, operating towards its extinction, and the convulsions of death itself have been deemed evidences of a stimulating power in opium, and of vigour derived from it.

• But we maintain, that opium, in some degree, constantly weakens and relaxes every animal function; that it benumbs sense, and makes us less apt for muscular exertion; and, that it never bestows strength, but when, by its sedative power, it suspends or cures diseases, in which spasms, pains, protracted vigilance, and excessive evacuation, weaken the system. Opium in this manner strengthens, when it puts an end to a nephritic fit, cures a cholic, moderates and checks any excessive discharge of blood, cures diarrhœa or gives rest in the torture of rheumatic and gouty pains.

• That the convulsions, and other re-actions, which appear in animals, arising from lesser doses of opium, and other sedative poisons, are not the effects of stimuli,



muli, appears from this: that large and increased doses of the same administered, instantly extinguish life, without struggle and resistance.

‘ Dr. Cullen allows (*Mat. Med.*) that narcotic generally weaken the powers of vital motion: yet inconsistently asserts, that opium, in its first operation, often irritates the sanguiferous system, and excites the force of circulation. The only colour for this assertion seems to be the conflict which takes place between the natural and morbid stimuli, acting on irritable organs, and the sedative power of doses of opium, insufficient to quiet these irritations altogether. The fact is this, the forces of the heart are weakened, and the circulation of blood retarded by the sedative power of opium, if the dose be sufficiently powerful. If small and inadequate, the effect may be imperceptible; but it would be absurd to alledge, such doses create powers they are unable to suppress.

‘ It has been said, the stimulant, as well as sedative power of opium, is manifested by some of its preparations, proving powerfully sudorific. Not to mention the powerful stimuli added to opium in *Theriaca* and *Dover's powder*, and other compositions, sweating is generally caused by relaxation of the surface of the body; in this operation, opium brings on a state, in some respects analogous to the sweating, which, in relaxed constitutions, takes place during sleep, the effect of debility; and, as in hectic diseases, of colliquation.

‘ In a word, the operation of small and salutary doses of opium, *is ever potentially sedative*, and exactly similar to that by which, in poisonous doses, it is known to destroy irritability, and extinguish life.’

Art. 3. *Case of Angina Pectoris, from an unexpected Disease in the Heart.* — Besides the ordinary symptoms of this disease, the patient was affected with pain and indigestion in the stomach. On dissection, the stomach, it is said, was found covered with a black mucus, quite empty, much discoloured, in many places black, particularly about the pylorus; the blood vessels over it very much

distended; the liver indurated in every part, but mostly so about its edges; the heart very putrid, admitting the fingers to pass through it with very little pressure; it was quite empty, and its vessels perfectly sound.

Art. 4. *An Account of two extraordinary Cases of Gall Stones.* — The size of the stone voided, in the first instance, was one inch and three-tenths in length; transversely it measured at least seven-tenths of an inch. In the second case, gall stones were discharged from an abscess about the pit of the stomach.

Art. 5. *History of a Fœtus born with a very imperfect Brain.*

Art. 6. *Of the Appearances of Urine, in Diseases attended with a State of Blood tending to Putrescence.* — In all diseases of the putrid class, Dr. Johnstone has found the urine turbid, thick, or settling, which he considers as a characteristic mark of a putrid tendency and disposition in the fluids. He quotes a case from *De Haen*, of a young man, who had the operation for the popliteal aneurism performed, and in whom, during the cure, the wound repeatedly put on a gangrenous appearance. Whenever this was the case, the urine was constantly observed to become turbid. This Dr. Johnstone considers as a proof of a disposition in the fluids to putridity. To this conclusion, however, there is much room for objection. The tendency to gangrene is neither a proof of the putrescency of the fluids, nor does the appearance of the urine indicate any thing more than a change in the action of the vascular system.

Art. 7. *Case of George Lord Lyttleton.* — This was a case of palpitation of the heart, dyspnoea, and interruption of sleep. Dissection shewed no cause to which these symptoms could be attributed.

Art. 8. *Some Account of hepatitis suppurans.*

Art. 9. *Two Cases of suppurated Liver.* — These observations afford nothing new on the subject.

Art. 10. *Two Cases.* — One of schirrus of the pylorus, the other a case of epilepsy. On dissection of the latter, the arteries were found to contain much blood,



blood, and there was an effusion of water in the ventricles of the brain.

Art. 11 & 12. *Cases of Hydrophobia, with Remarks.* — Three instances of this disease are here brought forward. In the first case, the patient, under the care of Dr. Rutherford, professor of medicine at Edinburgh, was profusely bled. The enormous quantity of sixty-six ounces was gradually taken away at one time. Opium, and the other common remedies were likewise ineffectually administered. The other two cases were treated with mercury, in very large quantities, and were both speedily fatal.

Thus, every additional case, that is clearly marked, serves, more and more, to point out the inefficacy of all means hitherto tried for the relief of this dreadful disease. The inutility of mercury, proved now in numberless instances, during the actual presence of hydrophobia, leads us to doubt the reality of its preventive powers, which have been so strongly asserted by the French writers. At all events, its further trial, when the disease has taken place, must be considered as trifling with the life of the patient, and we should exert our endeavours, in the search of new remedies, since nothing, hitherto employed, seems to give a tolerable chance of success.

The *Essay on mineral Poisons* forms part of a collection on medical jurisprudence, which the author hopes, at a future time, to lay before the public. The effects of each of the mineral poisons are described, before and after death; the mode of operation attempted to be ascertained; and the method of cure, in each case, pointed out. By mineral poisons, he understands those substances which, when taken internally, or applied externally to the bodies of animals, in certain small quantities, prove universally hurtful or destructive to them, by a sudden and specifically deleterious operation. These may be divided into two classes; such whose operation is so sudden and obscure, as almost to baffle conjecture; and those whose operation we can



partly explain, as proceeding from their active or corrosive qualities.

The author divides the mineral poisons into *metallic*, *earthy*, and *saline*, or compounds of one or other of these. The metallic poisons are: arsenic, mercury, antimony, copper, lead, silver and gold. The earthy poisons are: calcareous earth, barytes, or ponderous earth, and siliceous earth. The saline poisons are: the sulphuric, nitric, and muriatic acids; and the mineral alkali. The compounds of these poisons are, in general, more virulent than the simple substances; and some of them become poisonous *only* by combination. The following is the general history of these substances, as given by the author.

I. ' ARSENIC is soluble in water, and in all the acids and alkalies. It is often found naturally combined with many of the metals; and, by art, it may be combined with all of them. The base of arsenic consists in an acid; which is procured by chemical analysis. It is this acid that unites so readily with alkalies, and which may also be joined to sulphur, metals, and earths. With sulphur, the compound becomes, to a certain degree, innocent. All the other compounds are poisonous, in proportion to the quantity of arsenic they contain. As it is not my business to dwell on the different preparations of arsenic, I beg leave to refer the reader, for a more particular account, to the second volume of *Bergman's Essays*, which contains a great number of good facts; although the theory by which they are explained, be now exploded. I before remarked, that all the compounds of arsenic are noxious, in proportion to the quantity they contain of the mineral: thus they are all milder than the pure acid. The regulus is less active than the white oxyd; and, perhaps, the neutral salts of arsenic, with alkali, are more mild than any of its other saline preparations, when there is no superabundance of acid. I do not, however, insinuate, that *any* of its preparations are void of danger. Sulphur softens the acrimony of all the noxious metals,



metals; and yet they are not always to be trusted to, even when combined with it. The action of the stomach, upon the compounds that have one deleterious ingredient, may be such as to let it loose in all its native malignity; none of them are ever to be implicitly trusted, since accident may uncombine them.

2. ‘**MERCURY**, in its native state, is intirely harmless; it becomes active only by combination with oxygene, or saline substances. With the three mineral acids it forms the most active preparations; with the muriatic acid, it sublimes into a poison as malignant and deleterious as the oxyds of arsenic, commonly called corrosive sublimate. With the nitric acid it forms another corrosive poison, less virulent, indeed, than corrosive sublimate, but equally capable of destroying animal life, when administered in sufficient quantity. Its compound with the sulphuric acid, is neither so corrosive nor so fatal in its usual operation, as the former two; still, however, its activity is such, as to be capable of producing very dangerous consequences. There are other preparations of mercury, resulting from combinations with different quantities of acid or alkali, &c. which, though less active than either of those I have now enumerated, are far from being void of such a degree of stimulating power as to render them innocent. The oxyds of mercury are active in doses of three or four grains; they may prove, therefore, very dangerous stimulants, in the quantity of a drachm, or even of a scruple. Sulphur renders mercury, as it does most of the other metals, to a certain degree, inactive. Compounds of this sort are often given in large quantities, without bad effects.

3. ‘**ANTIMONY** is usually found united with sulphur, and in this state is inert. The pure oxyds shew but little activity, unless they meet with acid in the stomach, and then they are violently stimulating, in the smallest dose. With acids, antimony shews all its power, and its preparations yield, in violence, in no respect, to those of mercury. With the muriatic acid, it forms a corrosive compound, commonly called, but-

ter of antimony ; which can be compared with the muriated mercury, for violence. Its oxyds are active in much smaller quantity than those of mercury.

4. ‘ COPPER is one of the minerals the most universally poisonous we are acquainted with. In all states, it is noxious to the bodies of animals ; nor do I know of any combination that neutralizes its baneful qualities. Water, the animal fluids, the acids, alkalies, and oils, all bring it into action. The list of its poisonous preparations is not circumscribed by any exception, unless sulphur affords any, as copper, in every form, is deleterious to animals, in proportion to the quantity taken into their bodies.

5. ‘ LEAD, in its metallic state, is not so readily acted upon, by the aqueous liquors, as copper ; it is therefore not so dangerous when swallowed in this form ; and in no state is its action so quick as that of copper. Its combinations, however, are as various ; and in other respects, there are as few exceptions to its malignity. With acids, lead forms its most active preparations.

‘ SILVER AND GOLD. — 6.- Silver affords only two poisons. The first is, when joined with the nitrous acid ; the other, an oxyd of this metal, precipitated by means of ammoniac, called fulminating silver. The first is one of the most corrosive substances we are acquainted with ; the other I never knew taken into the body, and consequently cannot judge of its effects but by analogy. It is probably one of the most inflammable substances in nature, as it inflames at a degree of heat little above that of the human body, with a most tremendous explosion.

‘ Of fulminating gold we have some clearer knowledge — “ In duobus ægrotis (says *Plenck*) a tribus granis auri fulminantis tormina, ingentem debilitatem et profusissimam vidi salivationem.” He quotes instances when death was even produced by it. *Rolfincius* gave it to the quantity of six grains, and it only operated ‘ commota alvo : ’ and *Bergman* quotes other authorities for its diaphoretic powers ; but does not hint at any extremely violent



violent internal operation. There are many shades between tormina and commota alvo, especially when we consider, the greater effect was produced by the smaller dose.

‘ BISMUTH and ZINC are ranked among the poisonous minerals by some authors ; in my opinion without sufficient authority. Bismuth is, and has been long, so largely employed as a cosmetic, and a paint, that it is hardly probable, but its peculiar qualities would have been detected, was it peculiarly hurtful. We must not argue from the similarity of its general properties to lead, as it is well known, that many chrystals and fossils have all the marks of external similarity, without the least resemblance in action.

‘ ZINC has a much better claim to the title of poison, on account of the activity of vitriolated zinc, which acts as an emetic, in the quantity of fifteen or twenty grains. It is most probable, that active compounds are formed by its union with the other mineral acids ; but this I do not know from my own experience, nor can I assert from that of others. The action of vitriolated zinc is such, that I think it will seldom stay long enough in the body to produce any hurtful effects, in whatever dose it may be taken. The pure oxyd can be given to the quantity of ten or twenty grains, often without any apparent effect ; and when it does operate, only with sickness. At any rate, none of the preparations have a specifically deleterious operation ; and have, therefore, no better claim to be ranked among the mineral poisons than ipecuan has among the vegetable.

‘ Some of the other semi-metals have been found occasionally poisonous ; but as this happened from an admixture of arsenic, there is no reason for admitting them here.

‘ So little is known of the compounds of platina, that I cannot say, whether they are ever deleterious or not.

II. With the earths, the poisonous combinations, luckily for mankind are few—

I. ‘ In

1. ‘ In its pure state, calcareous earth is so caustic, that it must prove deleterious when taken internally, or applied even externally, in large quantities: in this form it is called quick-lime. When combined with carbonic gas, which it is always found to be in a state of nature, it is entirely harmless. Combined with a pure, or, as it is called caustic alkali, quick-lime becomes much more corrosive, than even in its purest state. All the other combinations are quite innocent.

2. ‘ Barytes, is always found united to a considerable quantity of carbonic gas; and I much doubt, whether it be harmless even in that state: when the gas is expelled, it becomes, in most respects, like quick-lime, with all its corrosive qualities. With the muriatic acid it forms a compound, which, by experiments on dogs, has been found deleterious.

3. ‘ Silicious earth cannot be said to be poisonous in its natural state; though, when mixed with alkali, and fused into glass, it affords a substance which, by its mechanical action, is capable of doing the greatest injury to the stomach, and thereby of destroying life. In the same way, the natural compounds of silicious crystals must be supposed to act. It may, perhaps, be too curious to add these to the list of poisons; as, with equal reason, small pieces of sharpened iron might be ranked among deleterious poisons. I have purposely omitted many others; such as *selenite*, *calcareous crystals*, &c.

III. ‘ All the concentrated mineral acids are highly corrosive; therefore, when swallowed undiluted, they are noxious to animals. 1. ‘ The *sulphuric acid* is most common; but none of its compounds, except those with oxygen, are more corrosive than itself alone. Its acrimony is not corrected by admixture with the other acids, as it is, in a great degree by combination with alkalies. This acid is rendered more or less caustic by the greater or less proportion of oxygen joined to it. — This is indeed the case with all the mineral acids.

2. ‘ The



2. ' The *nitric acid* is more corrosive in its most oxygenated state, than the sulphuric, and more active than any of its own preparations. With the muriatic acid it forms a very caustic compound, called aqua regia, on account of its power of dissolving gold. With the alkalies, its neutral salts are far from being inert, though they are infinitely less active, than the concentrated acid.

3. ' The *muriatic acid*, in the state we commonly meet with it, is corrosive; but its powers are wonderfully increased by the addition of oxygene, in double quantity: it is then, probably, one of the most powerful solvents in nature. Combined with mineral alkali, it forms common salt, which certainly cannot be denominated poisonous; and with other alkalies, its compounds are far from being remarkably active.

4. ' Of the *alkalies*, that which is called *soda*, or *natron*, is the only one that is indisputably mineral, and even this is prepared in great quantities from plants. But it exists in such prodigious abundance in the waters of the ocean, and in an uncombined state in some particular parts of the earth, that its origin is rendered certain. The mineral alkali, collected from sea salts, or by any of the usual modes of collecting it, is always found united to a very large proportion of carbonic gas. In this state, it is sufficiently active to prove hurtful to animal bodies, when taken in large quantities; but its powers are not fully unfolded, till all the gas is expelled; it then becomes so corrosive that it has obtained the name of caustic alkali. When united with acids, it is converted into salts, mild in proportion to the acridity of the ingredients, though in most cases retaining a certain degree of activity. When mixed with pure calcareous earth, or barytes, the compounds are more caustic, than either of the original ingredient.'

The author, in the next place, proceeds to determine their effects, as deduced from observations and experiment together with the means of obviating these effects. He professes to have made few or no experiments.

ments himself, but to have collected his facts, from other sources. It will not be necessary, therefore, for us to follow him in a beaten track.

With regard to mineral, as distinguishable from other poisons, he remarks, that they may be distinguished from vegetable poisons by their action. All the mineral poisons corrode, stimulate, or inflame: the vegetable generally stupefy, and leave no marks of inflammation. None of the minerals terminate life, till after a most excruciating operation of two or three hours at least; whereas some of the vegetable destroy in a few minutes. From the animal poisons the distinction is as striking: for although in the plague the mouth and throat are frequently affected in a similar way, yet the local disease of the stomach is never present. The aerial poisons operate still more quickly than either of the other classes; and their action on respiration is so peculiar, that it can never be mistaken.

We shall conclude our account of this essay, with the author's theory of the action of poisons on the animal body. Not that we deem his opinions conclusive; on the contrary, his idea of death being produced by the abstraction of oxygene, certainly cannot be maintained.

‘Of the mode in which arsenic operates, there are two theories. The one is, that its deleterious properties are owing to the action of its sharp spicula, on the stomach: the other, that it has a peculiar action on the nervous system. Both these theories may contain, perhaps, some truth; but neither of them are true to the extent meant to be inculcated. That arsenic acts with great stimulating and corrosive power, upon the stomach, is certain; but this is by no means all. Supposing spicula to be as sharp as their nature will admit, their most extreme sharpness will not account for the short time in which death takes place: was the stomach torn to pieces, life would not be extinguished in four or eight hours, as it often is from arsenic.

‘Of the operation of arsenic, or indeed, of any other power on the nerves, nothing is known. That it acts upon them, as well as on the other constituent parts of  
the



the stomach may be readily conceived; but there is certainly no reason for giving them the exclusive privilege of being injured: the fact is, that the *supposed* action of the nervous system, is the most specious cloak ever invented by medical ignorance. It saves the physiologist the trouble of inquiring, and the physician the labour of acting: — We know not what it is, and we therefore ascribe all the unaccountable and unfounded operations of the body, to its influence.

‘ A fair induction from the appearances of the body, and the analogy of these appearances to those in some other cases of sudden death, will afford us a better clue by which to conduct our inquiry, than any hypothesis, however splendidly adorned, and however ingeniously defended.

‘ That the action of arsenic is, in the first place, violently stimulating, whether internally or externally applied, cannot be doubted: it gives the sensation of heat to the tongue, without being swallowed; and rubbed upon the arm, or the face, it excites redness and heat: when swallowed, the appearances of inflammation extend as far as it has reached. After death, putrefaction commences in a much shorter time, than from any of those common diseases, which are the usual avenues to the grave.

‘ From most of the poisons, of whatever kind, from some of the diseases which occasionally spread devastation over the earth, the case is the same. Animals destroyed by vegetable poisons, persons who die of the plague, and the more malignant species of typhus, become putrid in a very short time. Life is extinguished, after a short and violent struggle, so completely, that the component parts of the body are disunited, and melt down into their original particles. In some instances, this is done without pain; life is even dismissed from the body without a struggle: in others, the conflict is more laborious. — *Lauro-cerasus* contains a power, that will extinguish animal life in the former way; arsenic, in the latter, on account of its corrosive qualities. It is not, however, in my opinion, unfair to infer, that death, in all these cases,  
has

has the same general cause, from a principle which acts on the body, as it is compounded of various materials; and by its operation on some one or other of these, so deranges the whole, as to render it incapable of retaining life.

‘ Various powers, capable of destroying life, may be possessed of different properties, besides the essential one; and these properties will account for the diversity in the modes of death, from the various poisons. The corrosive qualities of arsenic, account for the pain and inflammation it excites, while abstracting the vital principle. Lauro-cerasus has no such power, and therefore it destroys without pain or inflammation. The poison that produces the plague, has killed persons instantaneously; its more general term of operation, is two or three days, and the symptoms it produces are various, according to this term. But in all these cases, there is something in the mode of destruction which obviously points out the same general cause; not as acting merely upon the nerves, nor as acting merely upon the blood; but as disuniting the component parts of the whole body in some manner, so as to produce death in a very short time.—What this cause is, we cannot explain, because we know not how life is joined with the body, in all cases.—Upon this subject I can only advance some obscure suggestions.

‘ Do not poisons act upon the muscular fibres, as well as upon the blood and the nerves? Do not the motion and powers of these fibres, depend upon their union with oxygene, taken into the body by respiration, and diffused by the circulation of the blood? Does not the action of poisons consist in disuniting the oxygene from these fibres so rapidly, as to extinguish their vitality, before they can have a fresh supply? The sudden extinction of life, in all cases in which the blood is deprived of oxygene, and the immediate succession of putrefaction, entitle me to make these suggestions; and give some colour to an opinion, which an enlightened and reformed system of physiology will, perhaps, some time or other, satisfactorily explain.

For



‘ For attributing the action of arsenic *solely* to the nerves, there is no one shadow of reason: on the contrary, the experiments of *Fontana* prove that poisons have no effect on the body, when applied *solely* to them. Nor have the experiments of *Galvani* or *Volta*, hitherto added much to our knowledge of the nerves: we before knew that they were capable of conveying the stimulations of the will, or of acrid substances, to the muscular fibres; and the experiments with two metals, only afford a more extensive illustration of this important fact, *in some unknown manner*, on whose properties we must pause, till better acquainted with its laws and relations to animal bodies.

‘ Nor can I agree with *Fontana*, in ascribing the action of poisons solely to the change they produce in the properties of the blood. Frogs, it is well known, retain a portion of vitality for many hours after their hearts are cut out; and yet, when they are placed in poisons without their hearts, the remains of life are instantly destroyed. Perhaps it may be urged, on my own grounds, that poisons act by decomposing the blood, and *thereby* prevent the muscular fibres from receiving that oxygene, which is the pabulum of vitality. But the experiments on animals alluded to before, in which the circulation was destroyed, seem to prove, that vitality may be acted upon by means independent of the circulation, and hence I conjecture, that the muscular fibres of the whole body are affected by some communication which is pervious only to poisons. In some cases, (as from laurel-water, and the miasmata of the plague,) this communication is so instantaneous, as to destroy every portion of life without a struggle: in others, the communication is more slow, and life is destroyed, after a certain interval, unequally, in different parts of the body; hence the convulsions that ensue, are the last efforts of expiring nature, to restore the just balance of the moving powers.’

ART. XLIV. *Transactions of the Royal Society of Edinburgh.* Vol. III. — 1795.

**I**N the physical class of this volume we find the following papers relative to our work : —

*Observations on the Muscles, particularly on the Effects of their oblique Fibres.* By Dr. MONRO. Read, January 1793. — Dr. Monro observes, that the structure of the oblique muscles had not been sufficiently examined, nor even the number of them attended to by authors, and that some of their chief purposes or effects had been entirely overlooked : it has been his object, therefore, to direct the attention of students particularly to these subjects. He remarked as a material defect in the otherwise very accurate and elegant tables of Albinus, as well as in the former systems of Vesalius, Eustachius, Bidloo, and Couper, that the tendinous membranes, or aponeuroses, with which many muscles, particularly of the extremities, are covered, and with which the oblique muscles are closely connected, were not delineated, yet that the knowledge of these is not only of use in the practice of surgery, but for understanding the action of the muscles :

That although in some parts of the body, tendinous membranes, such as those between the cartilages of the ribs, or the aponeuroses palmares, or fasciæ latae of the thighs, served merely for the defence of the parts, or as sheaths to them, as they were connected to them by the cellular substance only, yet, in general, they served, besides the mere purposes of defence, to furnish a greater extent of surface for the attachment of oblique fleshy fibres :

That wherever tendinous membranes run longitudinally on the surfaces of the muscles, fleshy fibres, placed obliquely, were found ; that in many muscles, as in the semi-membranosus, or flexor pollicis longus, fleshy fibres passed obliquely from the inner part of the tendon on one side, to the inner part of the tendon on the other side of the muscles, or such muscles were semi-penniform ; that



in the other muscles, as in the *rectus extensor cruris*, or *flexor pollicis pedis longus*; a third tendinous membrane was found in the middle of the muscle, between which and the inner parts of the tendons on the two sides of the muscle, the fleshy fibres passed obliquely, and produced a complete penniform appearance; and some muscles, as the soleus, might be called compound penniform, because, on cutting them lengthwise, we discover several longitudinal tendinous membranes, to both sides of which oblique fleshy fibres were connected:

That the direction, length, and number of fibres in such muscles had not been sufficiently attended to by anatomists or by surgeons; and that, in many instances, the breadth of these muscles had been mistaken for their length; that in consequence of such inattention, we find the celebrated Louis\* attempting to discard the double incision of the soft parts in amputation of the thigh, although, from the obliquity and shortness of the muscular fibres which cover the thigh-bone, this improvement of Cheselden is more essential than in the amputation of the humerus, where the fleshy fibres, though oblique, are proportionally longer, and of course their retraction greater:

That where the fibres of muscles run obliquely, it is evident, and has been observed by Borellus and others, that the fibres will be more numerous than if the same space had been covered with longitudinal fibres; and although an oblique fibre will not raise a weight, with the same force as a straight fibre, yet the number of the fibres may be so much increased by their obliquity, as to do more than compensate for the loss of force occasioned by the obliquity:

But that the mere increase of the number of fibres, or force of the muscles, which alone has been observed by authors, is not the sole purpose of nature, appears from this, that in some places, and particularly between the ribs, oblique fibres are employed, although it is evident, that a greater number of straight fibres, or of fibres per-

pendicular

\* Acad. Roy. de Chirurg. Tom. ii. p. 357.

pendicular to the ribs, might have been disposed in the same space.

The other purposes of oblique muscles pointed out by Dr. Monro, and which had not been perceived by authors, are, to perform much more extensive motions with the same degree of shortening of the fleshy fibres, than can be performed by straight muscles, or, with a less degree of shortening of the fibres, to perform motions of equal extent: that where two oblique muscles balance each other, the motion of their insertion is more extensive than can be produced by two straight muscles of the same length with the oblique muscles; and that the extent of the motion increases with their greater degree of obliquity.

Dr. Monro demonstrates the truth of his propositions by diagrams, and a reference to the action of the oblique muscles, and particularly to that of the intercostals.

In the present volume we have also an account by Mr. John Lindsay, surgeon in Jamaica, of the *Quassia Polygama*, or bitter wood of Jamaica; and of the *Cinchona Brachycarpa*, a new species of Jesuits bark, found in the same island. The quassia polygama is a very common tree in this island; and grows sometimes to the height of an hundred feet, and ten feet in circumference. The wood is of a yellow colour, takes a good polish, and is used for flooring. Except the pulp of the fruit, every other part of this tree has an intensely bitter taste. In medical virtues it is said to be nearly equal to the *quassia amara* of Surinam. Mr. L. has seen the happiest effects from the use of this medicine in obstinate remitting fevers from marsh miasmata, in agues which had resisted the Jesuits bark, and in dysenteries of long standing. It is in daily use in Jamaica in dropries from debility, either in simple infusions or tincture by itself, or joined with aromatics and chalybeates. The dose of the bark, in powder, is from fifteen grains to a dram: Two or three drams or more of the bark or wood in infusion or decoction with a pint of water: the dose a wine glass full three or four times a day.



The *Cinchona Brachycarpa* was first discovered in the year 1784. The trunk and branches are of a brownish gray colour, with a few superficial furrows, and cross cracks like the Peruvian bark. The bark of the trunk is pretty thick, and when wounded, exudes a small quantity of a milky juice. The bark when dried is of a purplish brown colour on the inside. It is fibrous and more difficult to pulverize than the Peruvian. The powder is of a purplish gray colour, and tastes sweet, then bitter and astringent. The tree is scarce and small, and Mr. L. does not suppose the bark to possess qualities superior, if equal, to the other species.

Mr. L. mentions an effect of the red bark which has not been noticed by authors. When genuine, and given briskly in pretty large doses, it will, in particular cases, occasion a degree of anxiety, depression, giddiness, and faintness, that are alarming to the patient and his friends. This only happens in certain constitutions, and in weakly habits or those rendered so by disease.

*Description of a human Male Monster, illustrated by Tables, with remarks.* By Dr. MONRO. Read, 1792. — The monster, of which the mother was delivered by Mr. Thomas Anderson, surgeon in Leith, after the birth of a complete child at the full time, had its proper membranes and a placenta, with a short umbilical cord.

The following parts were wanting in it; to wit, the bones of the head; the brain, with the organs of sight, hearing, smell and taste; the neck; about one half of the ribs; the larynx, trachea and lungs; the heart; the pharynx, œsophagus and stomach, with all the small intestines, except the end of the ilium; the anus; the liver, spleen, pancreas and omenta; the renal glands; terminations of the ureters; the middle part of the urethra; the right testicle; both arms; both patellæ; with several of the bones of the feet and toes.

A round opening which led to a thimble-like cavity, shut at its bottom, had some distant resemblance to the mouth.

The soft parts of the trunk were supported by sixteen vertebræ, six ribs, an os sacrum, and two ossa innominata. The legs had each an os femoris, tibia and fibula, with an imperfect number of the bones of the feet.

The umbilical cord was connected at nearly the usual height above the ossa pubis.

The penis, covered with a large preputium, had the usual situation and structure.

The lower part of the trunk contained an intestinal tube, shut at its beginning, and composed of an upper part, four inches long, resembling the end of the ilium; for it terminated in the side of an intestine, resembling the caput coli, with its appendix vermiformis. From this place, to its lower end the great intestine measured thirteen inches; and the end of the rectum, which was much contracted, terminated in the back part of the bladder of urine, above its sphincter. The rectum contained viscid semipellucid mucus, but no black stuff, like the meconium.

In the mesentery and mesocolon, there were about a dozen conglobated lymphatic glands, of the usual shape, colour and consistence. From which it appeared, that the intestines were provided with lacteal vessels; and we therefore cannot doubt, that the other parts of the body were furnished with lymphatic vessels, or that there was an absorbent, as well as circulating system in this monster.

At the upper part of the trunk, covered by the ribs, there were two kidneys of a large size, with a pelvis and ureter to each. The right ureter was dilated to the size of a goose's quill. The left one was small. Both were shut at their under ends, and had no communication with a small sac, which, in situation and structure, resembled the bladder of urine, and had an urachus coming from it.

There was only one testis, situated in the usual manner, on the left side,

The prostate gland surrounded, as usual, the neck of the bladder.

The



The urethra, which was the common passage for the fæces, as well as for the feminal liquors, and that of the sac resembling the vesica urinaria, was wanting from within an inch of the vesica to within an inch of the extremity of the penis.

The spinal marrow was of a conical shape, with the top or small part of the cone at its upper end, and at its lower end it formed a cauda equina. From its two ends and sides, it sent off eighteen pairs of nerves; which, at their origin and in their progress, were nearly as large as they are in a perfect foetus, or where the brain and cerebellum are connected with the spinal marrow.

The umbilical cord was nearly proportioned to the bulk of the monster; and, at the umbilicus, consisted of one vein and two arteries, within which was found red blood. The vein was more capacious than both arteries conjoined; and, as soon as it entered the abdomen, was divided into various branches, which were dispersed upon all parts of the body.

Vessels, every where, accompanied the branches of the umbilical vein, corresponding with them in size, as well as situation; and, joining together, formed trunks, from which, at the sides of the pelvis, two vessels were continued, one of them on each side of the vesica urinaria and urachus, to the umbilicus, which they perforated, and then went along the umbilical cord, towards the placenta, resembling the umbilical arteries.

Unluckily, before Dr. Monro received the monster from Mr. Anderson, he had intrusted the injection of its placenta to some person, who had managed it so negligently, that nothing could be determined as to the distribution or communication of the vessels of the placenta with each other, or with those of the placenta of the complete child, or with those of the mother.

On monsters similar in structure to that above described, Dr. Monro offers several remarks. Monsters wanting the head, heart, and lungs, have been mentioned by Winslow, Mery, Roederer, &c. but the real course of the blood, or the causes of its motion, appear to have

been misapprehended by all these authors. Rejecting, therefore, their opinions on this head, he offers the following explanation of the matter.

‘ *Of the direction of the blood in this monster.* As there are two kinds of vessels in the umbilical cord, and likewise within the body of this monster, which we shall call, in the common style, arterious and venous, we cannot doubt, that these communicated with each other, and that the blood was conveyed by them in a circle.

‘ To describe the circle more exactly, we cannot doubt, that the blood was conveyed from the placenta by the umbilical vein into the body of the monster. We next found, that the umbilical vein within the monster was divided into various branches, which could be traced to all its parts, or that these branches performed the office of arteries, or resembled the vena porta hepatica.

‘ Contiguous to these branches, we found every where, other vessels which formed a trunk or large vessel, which, by its situation, resembled our aorta. But we must suppose, that these branches served the purpose of receiving the blood from the extremities of the branches of the umbilical vein, or were in reality venous vessels. From the vessels resembling the aorta in situation, but very different in office, two vessels were sent off, which ran at the sides of the bladder to the umbilicus, and formed the arteries of the umbilical cord and of the placenta, and, in the placenta, must have terminated in the minute beginnings of the umbilical vein, to complete the circle in which the foetal blood was moved.

‘ Thus, we observe the umbilical vein in the placenta and umbilical cord performing the office of a vein, but its continuation within the body of the monster, performing the office of an artery. On the other hand, we find the vessel we have called aorta, performing the office of a vein within the monster, and that of an artery in the umbilical cord and placenta.

‘ *Of the causes of the motion of the blood in this monster.*— In the monster, examined by Winslow, which I have endeavoured to shew agreed very nearly with that I have



have described, no red blood was found in any of the vessels; and therefore we must conclude, that none of the red arteries of the monster anastomosed with the umbilical veins; and even where there is the ordinary structure, it is so far from being certain, that the vessels of the uterus, which convey red blood, anastomose with those of the umbilical cord, that the contrary is the most probable opinion.

‘ It is therefore very improbable, that the blood in the umbilical vein was pushed on by the heart of the mother.

‘ Further, though we were to admit, that the arteries of the mother anastomosed with the umbilical veins, yet as their communications must be supposed to be very minute, and the momentum of the blood in them very much broken, we cannot conceive that it could have been sufficient to push the blood through the terminations of all the branches of the umbilical veins, in the several organs of its body, into the vessels we call aorta, and again from the aorta back to the placenta by the umbilical arteries, and through the minute branches of these to the veins of the mother, and beginnings of the umbilical veins.

‘ We therefore must conclude, that the circulation of the blood in the placenta and body of the monster, was carried on by a well regulated muscular action of the blood vessels. In one of the worms, the *echinus esculentus*, I found in the mesentery, which is a principal part of it, two such large vessels without a heart, and which, we can scarcely doubt resembled our aorta and cava, and circulated its fluid; and in fishes, the blood which passes through the liver describes three circles, and in all other parts of the fish the blood describes two circles before it returns to the heart; which motion of it we must suppose to be chiefly owing to the muscular action of the vessels, as the force of the heart appears to be as much spent in the gills of the fish as in the lungs of a man.

‘ From considering the manner and cause of the motion of the blood in this monster, and comparing with it the motion of the blood in fishes, and in the sea egg, we are, by analogy, led to the following general conclusions: — 1. The arteries contribute much to the circulation of the blood in our bodies. — 2. It is probable that, in man, the veins likewise assist in circulation; and, in particular, there can be no doubt, that the vena portarum, by its action, contributes much to the motion of the blood through our liver. — 3. For the like reasons we may conclude, that arterious vessels, independent of the impulse of the heart, may act in such a manner as to perform the secretion of liquors, to nourish the solids, and to add to their bulk: and, particularly, that the branches of the vena portarum change certain parts of the blood into bile.

‘ *Remarks on the nervous System of this monster.* — 1. As the spinal marrow, and pairs of nerves sent off from it, had nearly the usual size and structure, although the brain, cerebellum, and medulla oblongata, were entirely wanting, we find reason for calling in question the common doctrine of authors, which teaches, that the spinal marrow and nerves derive the origin from the brain and cerebellum, and are dependent upon it as much as the ducts and glands are upon the glands, which send liquors into them.

2. ‘ Further, as the several parts of this monster were furnished with nerves, and as we have found, that its arteries and veins, by a well regulated, varied, and complicated action, circulated the blood, we must suppose, that their muscular fibres were actuated by those nerves. We therefore find, in the monster, not only the existence and common appearance of the spinal marrow and nerves connected with it, although the brain and cerebellum were wanting, but we have proof that these, independent of the brain and cerebellum, may actuate the muscular fibres in the vessels of an animal, or that nervous energy, or fluid, as it is com-  
monly



monly called, is not derived from the brain and cerebellum solely; that is, we conclude, that the nerves, as well as the brain and cerebellum, are capable of furnishing nervous energy; and that there is no more reason for believing, that the nerves are derived from the brain, than that the brain is derived from the nerves; or all the parts and branches of the nervous system appear to possess the general power or office of furnishing nervous energy.

‘ *Of the Duration of the Life of this Monster.* — As in man, and similar animals, the direct or indirect influence of respiration seems necessary for the continuance of life: and, as the lungs were wanting in this monster, we must suppose that it could have out-lived the separation from the mother for a very short time only. But when we add to this, that by the ligature of the umbilical cord, a stop would be mechanically put to the circulation of its blood, it is evident, that its life must have terminated with its delivery.

‘ *Of the Time at which this Monster must have acquired the Structure which has been described.* — As this monster was provided with a distinct placenta and membranes, and its body surrounded with and protected by the liquor amnii; as no vestige appeared of the brain, cerebellum, organs of the senses, or other parts of the head; as nervous threads, proper to this monster, ascended from the upper end of the spinal marrow towards the upper parts of its body; as its system of circulating vessels was complete, without a heart, and the manner of their branching different in many respects from the common structure: it must surely appear, to an unprejudiced person, absurd to suppose, with many eminent authors, that such monsters, when first produced, had the ordinary structure, and that this was afterwards altered by pressure and other accidents.

‘ The like observation may be extended to many other monsters in my possession; I believe I might say, to almost all other monsters which have been described; particularly

particularly to two, of which I published a description, illustrated with figures, in my work on the Nervous System. In one of them, a human monster, one heart supplied two heads and two trunks. In the other, a kitten, one heart, consisting of two auricles and two ventricles, sent off from its left ventricle one aorta, which supplied one head and two bodies.\*

*Experiments relating to animal Electricity.* By Doctor MONRO. — These experiments have been already before the public in a separate treatise, an account of which we gave in a former number.\*

ART. XLV. *A short Account of the Nature and Properties of different Kinds of Airs, so far as relates to their medicinal Use; intended as an Introduction to the pneumatic Method of treating Diseases, with miscellaneous Observations on certain Remedies, used in Consumptions.* By RICHARD PEARSON, M. D. Physician to the General Hospital near Birmingham, &c. — 8vo. 27 pages, price 1s. — BALDWIN, London. — 1795.

THE present account of factitious airs has been drawn up in the hope of rendering the pneumatic method of treating diseases more generally understood. The author has endeavoured to bring together, under one point of view, the principal facts and discoveries relating to the subject. He begins with a general account of respiration, and the chemical composition of atmospheric air.

Besides the airs of which the atmosphere is composed, there are various other kinds of airs, or permanently elastic fluids; and, as they have active properties, it has been thought that they too might be applied, advantageously, in certain deviations from health. They are called, generally, *factitious airs*, and are either *inflammable* or *uninflammable*. Of the former kind is *hydrogene*,  
of

\* Vide Med. Review, No. VII. for July, 1795.



of which there are several species or varieties, differing in their specific properties, according to the different nature of the substances, from which they are produced. Thus, we have *martial hydrogene*, from heated iron and water; *zincic hydrogene*, from melted zinc and water; and *carbonated hydrogene* or *hydro-carbonate*, from red-hot charcoal and water. All of these diminish the heat of the body and lower the pulse. The two former may be administered in the proportion of one part to five or six of atmospheric air; but the last should be in much smaller proportion, as one-fifteenth or twentieth.

Under the head of unflammable air, the author only notices *fixed*, or *carbonic acid air*. Applied to the lungs, it is cooling, but not so depressing as the former, and has the property of checking putrefaction: it may be used in the proportion of a twelfth part, with atmospheric air.

Thus, it appears, we have six kinds of air for medicinal use; viz. oxygene, azote, three species of inflammable air, and fixed or carbonic acid air. On their application to particular diseases, the author has offered nothing new.

On the subject of consumption, he mentions the great advantage derived, in the West Indies, from sending the negroes, afflicted with this disease, to breathe the air of the sugar houses, which he attributes to the extrication of fixed air in considerable quantities from the fermenting liquors. He notices, likewise, the relief which some persons are said to have received from breathing the air of cow-houses; which he explains on the same principles.

Lastly, he observes, that he has found the vapour of vitriolic æther remarkably serviceable in phthical cases. His mode of applying it is, to direct one or two tea spoons full of æther to be poured into a tea-saucer, which is held up to the mouth; and the vapour arising from it, without heat, is drawn in with the breath. The inhalation is continued till the saucer becomes dry; and this is repeated two or three times a day, or oftener if necessary.

ART. XLVI. *A Dissertation on the Diseases of Prisons and Poor-houses: to which is added a singular Case of præternatural Fætation.* By J. M. GOOD. 12mo. 180 pages, price 2s. 6d. DILLY, London, 1795.

THIS Dissertation gained the prize, offered by the Medical Society of London, for the best answer to the following questions: *What are the Diseases most frequent in Workhouses, Poor-houses, and similar Institutions? And what are the best means of cure, and of prevention?* It contains, however, nothing very new or important. It is divided into three sections; the first containing what the author calls a short sketch of the Literary History of the places adverted to: the second, a History of the Diseases most frequently found in such situations, with the treatment necessary to be employed: and the third a Statement of what appears to the author to be the best means of preventing such diseases from recurring in future.

THE case of præternatural fætation, abovementioned, was one of twins, the first of which was born alive. It had no sexual characteristic, neither penis nor pudendum: it had no anus, funis, nor umbilicus. Its legs were distorted and curved outwardly. It cried feebly once or twice after birth, and died in about ten minutes. With the use of a little force, the author says, a small, empty, and shrivelled placenta followed; in which could be traced no kind of funis or umbilical vessels of any description, nor any other appendage, by which it could have been attached to the child. No discolouration of blood followed its abduction from the uterus. In a quarter of an hour afterwards the other child was born, in all respects perfect.

On dissection, besides other unimportant circumstances mentioned, it is said the right kidney adhered to, and communicated with the bladder. There was no urethra, nor internal organs of generation: no anus, nor rectum, the colon terminating insensibly in the peritonæum. No  
mention



mention is made of any attempt to discover the umbilical vessels within the body.

The author takes occasion from the foregoing case, to enter into the dispute concerning the mode by which the foetus receives its nourishment in the womb: whether from the mother, through the medium of the placenta and umbilical vessels; or by the liquor amnii. He deems the above case final, against the exclusive power of the placenta; and his own opinion is, that the placenta is the proper organ of oxygenation for the foetus, and the liquor amnii its proper source of nourishment; yet that the former is capable, nevertheless, of communicating nutriment whenever the amnios may fail, or be suddenly discharged; and that, *è contrario*, the amnios is capable of communicating oxygene, whenever the placenta should be defective or wanting.

ART. XLVII. *Tabula Nosologica: Morborum Classes, Ordines, Genera, Species, et Varietates, secundum Systema Cullenianum complectens.* — Large Sheet. — KAY, London. 1795. Price 1s.

THE title of the above sufficiently expresses its contents. Its merits consist, in bringing into one view, in a tabular and systematic form, the medical nomenclature of the late celebrated CULLEN. The characters are of course omitted.

ART. XLVIII. *A practical System of Surgery.* — By JAMES LATTA. — Vol. II. & III. 8s. 6d. each. 8vo. 1240 pages.

THE first volume of this work we have already noticed.\* Of the two last we may observe, that the doctrines inculcated in them contain nothing which entitle them to particular notice. Much ill-founded theory

\* Vide Med. Review, Vol. I. page 363; for January, 1795.

theory is, however, employed, which certainly detracts from the merit of a practical work. We shall content ourselves with transcribing a few of the cases which the author has given.

On the subject of wounds of the head, the author relates some cases, where a considerable degree of pressure on the brain took place, from depression of the skull, which, nevertheless, did well, without an operation. These we shall give in the author's words; without, however, taking upon us to determine, how far the practice adopted was prudent, or otherwise.

J. R. a boy of fourteen, apprentice to a book-binder, was struck, by one of his companions, on the left-side of the head, near the temple, with an instrument used for polishing books, with a small round head. He did not fall down, but felt excessive pain immediately after the stroke, and continued, for an hour and an half, to go on with the work he was doing. In about two hours after the accident, as the pain continued to increase, I was sent for. Not the least mark of external injury could be perceived; but the place where he said he was struck appeared to me to be just where the point of the left parietal bone is connected with the temporal, sphenoidal, and frontal bones, or nearly so. When I saw him, he was still able to go about, but he complained that the pain of his head was greatly augmented by pressure; his pulse was also remarkably slow, beating only sixty strokes in a minute, but full and regular in its contractions. Supposing the matter to be only a violent bruise received on the temporal muscle, I ordered twelve leeches to be immediately applied to his temple, upon the place where he had got the stroke, but without any relief. In an hour after his pulse beat only forty strokes in a minute, and he still complained very much of the pain, though still able to sit up. Such a remarkable alteration in his pulse made me suspect some internal injury, and I immediately bled him; but, an hour after this, his pulse sunk to thirty in a minute, he appeared more oppressed, spoke little, and became



became sleepy. All his symptoms increased very rapidly, and exactly four hours and fifteen minutes from the time the injury was received, he expired, but without any apoplectic symptoms. Five minutes before he died, his pulse beat only fifteen strokes in a minute. Even then the intervals were regular, and his breathing as free from any kind of oppression as it had been in health.

In this case the symptoms went on with such rapidity, that nothing could be done; and so uncommon an instance made me very attentive to the appearances which presented themselves on dissection. Next day I opened his head, and, on removing the scalp in the usual manner, I found the dura mater separated from the left parietal bone for more than two-thirds of its whole extent. There was a great extravasation of blood between the skull and dura mater, and the blood was firmly coagulated. On farther examination, I found the dura mater also separated from the whole superior part of the os temporum, above the petrose process, from the posterior and lateral portion of the frontal bone, from the external canthus to near the falx, and from the whole of the anterior and inferior part of the parietal bone, to near the lambdoidal suture, reaching upwards nearly half the extent of the parietal bone. The thickness of the coagulum at the bottom was somewhat more than one inch, decreasing gradually in every direction, as it spread from the wounded vessel, until the consistence or colour of it could hardly be perceived. From the inside I could easily distinguish a fracture and depression of that point of the parietal bone which joins the temporal, sphenoidal, and frontal bones, of a circular form; nearly of the shape, and about the same size with the head of the instrument by which the blow was given. A longitudinal fracture through the centre of it was likewise observed, running exactly in the groove of the os parietale, made by the arteria media duræ matris. On examining this fracture, we found that the artery had been wounded by a large sharp

sharp spicula of bone driven into it near the middle, and by this the hæmorrhage, which proved so fatal to the patient had been occasioned.

• From this case, which is perhaps as remarkable as any on record, we see the extreme uncertainty in the signs which are commonly thought to indicate a compressed brain. Here we have the most violent of all injuries, fracture, depression, and a great degree of extravasation, without even bringing the patient to the ground. We are not, therefore, suddenly to conclude that the cranium is not injured, because the patient retains his senses, and shews no sign of apoplectic stertor; for both these and other symptoms may not appear, and yet a mortal injury be done to the brain; as, on the other hand, all of them may appear, and yet the brain have sustained no farther injury than what is called concussion. The only remarkable symptom in the present case, was the extreme slowness of the pulse; but there are not a sufficient number of examples recorded from which we can judge whether this be a sign of extravasation or not.

• J. S. a boy of seven years of age, fell from the top of a stair of fourteen steps, and was taken up in a state of coma, with a division of the scalp on the right parietal bone, running in the direction of the fibres of the occipito-frontalis muscle. Having laid the bone bare for about an inch, I found a very evident depression, about an inch in diameter, but without the least appearance of fracture; and, as the violent symptoms had abated, I thought it most prudent to wait for a short time. The wound was very superficially dressed with a pledget of soft ointment, the child put to bed, and an injection administered, which operated well. The symptoms of stupor continued very strong for some hours, but after that time gradually abated; and in twenty-four hours he opened his eyes, and began to complain of his head. His pulse being increased in strength, as well as in frequency, I applied fix leeches to the temple, which discharged freely. The stupor, however,  
still



still continued in a considerable degree, and, on the third day, he vomited twice severely; his pulse being 112, full and hard. Five ounces of blood were taken from his arm, by which he was much relieved; his injection was repeated, and at bed-time he had a bolus of three grains of calomel, with fifteen of conserve of roses, with a cup of fenna tea in the morning. By this he was farther relieved, though his eyes continued very dull and heavy, and the pupils much dilated, but without any vomiting. Leeches were again applied; and he now began to take some light food, without sickness; and he slept also more quietly, with less starting and snoring than hitherto. On the fifth day the symptoms of compression were almost entirely gone; but, as his pulse was still hard and quick, six ounces more of blood were taken from his arm, by which the oppression on his eyes, as well as the hardness and quickness of his pulse, was greatly abated. His bolus was repeated at night. Next day the depressed part of the bone seemed to be considerably elevated, and healthy red granulations appeared every where to shoot up from the surface of the denuded part; his eyes looked much better, and he had slept six hours without the least oppression. In three days more the depressed part of the bone appeared to be completely elevated, though there was still an hardness and fulness of the pulse. Eight ounces more of blood were taken, and his laxative was repeated. By this the headach was almost entirely removed, and his pulse became much better than it had ever been since the injury. In two days, however, he began to complain of pain under the denuded part of the bone, his skin became hot, his pulse rose to 108, and became hard. Ten ounces of blood were taken from the jugular vein, and his laxative repeated at night, which operated well. As his skin still continued hot, three grains of Dover's powder were given every hour for four times successively. By this he sweated profusely for twelve hours, with great relief of every symptom; from this time he continued to regain his health, and, in a month from the time of receiving the injury,

injury, was completely cured, and has continued well ever since, which is now five years.

‘ From this case we see that there is not always any occasion for trepanning where the skull is depressed, and that nature hath endowed this bone with a power of rising up of itself; whether this be effected by the natural elasticity of its fibres, or by the gradual action and pressure of the arteries of the dura mater, though, whatever be the cause, it is probable that such elevations will happen more frequently in young than in old subjects. In like manner the cranium, like other bones, has power to unite itself, by a callus, when fractured; and no doubt frequently does so when fissured or fractured. The necessity for trepanning, therefore, does not arise merely from the skull being depressed or fractured, but from the brain being compressed, and no possibility of otherwise removing the pressure. In like manner, even though some quantity of liquid should be extravasated within the cranium, there is a possibility that it may be absorbed there as well as in other parts of the body; the necessity for performing the operation of the trepan, therefore, does not arise from mere extravasation, more than either of the other causes simply considered, but entirely from the injury done to the brain by compressing it; and, if we can, by any internal remedy, promote the absorption, we may also cure the patient, without running the additional risk incurred by the operation. But, when these remedies are found to be ineffectual, we are then, at all events, to proceed, provided we can by any means discover a place where the instrument ought probably to be applied rather than another.

‘ A. M. a female of six years and a half, fell from a table upon the left side of the frontal bone, immediately above the origin of the temporal muscle, by which a pretty large wound was made in the scalp, with an evident depression of the skull for more than half an inch in diameter. About eight hours after the accident I was called, and found the child comatose, the pulse about eighty strokes in a minute, and she had vomited several times.



times. The wound was dressed with charpee; and, as she had lost a considerable quantity of blood, I did not apply leeches, but contented myself with giving an injection, which operated well. The pupils of the eyes at this time contracted by the light as usual; and, in twenty-four hours after the accident, she seemed to be tolerably recovered; having during that time taken a few spoonfuls of panada, and some barley gruel, without any sickness or vomiting. For sixteen days matters went on in a way very similar to the former case; but, on the sixteenth day, she was seized with chillness and shivering, which, in a short time, was succeeded by heat and restlessness, attended with a quick and hard pulse. Ten ounces of blood were instantly taken from the jugular vein, and, as the wound now began to have a bad aspect, an emollient poultice was applied over it; an ounce of diaphoretic mixture was given every second hour till she should perspire freely. Next day the symptoms were considerably relieved; but, as the pulse still continued full, and upwards of an hundred in a minute, she was again let blood in the arm to about six ounces, and the injection repeated. By these medicines the headach was almost entirely removed, and the other symptoms of fever greatly abated; the matter discharged from the wound also became more copious, and of a better quality. In twenty days from the accident, every symptom of fever appeared to be totally removed, and, in a month, the depression was completely elevated, as in the former case; the patient was perfectly cured, and has continued well for several years.

ON the subject of collections within the capsular ligament of joints, we have the following case.

‘ J. S. twenty-nine years of age, after recovering from a severe rheumatic fever, observed a fulness and swelling in his right knee-joint, particularly on the anterior part of it, on each side of the patella. At first it was attended with no other inconvenience than a slight fulness and tightness of the joint, when he stretched it out, but by degrees became more troublesome and uneasy as it aug-



mented in bulk, notwithstanding the use of every external remedy which could be thought of, such as strong volatile camphorated oil, solutions of sugar of lead, and other astringent liquids, as well as blisters, &c. At last it became very large, and a distinct fluctuation was felt on each side of the patella whenever the leg was stretched out, as well as behind the joint at the top of the leg. His health being greatly impaired, both by the preceding fever, and the uneasiness given him by the tumor itself, he became extremely desirous of having it removed. Having tried in vain every external as well as internal remedy, I, with two other practitioners, proposed to let out the fluid, which appeared to be wholly contained within the capsular ligament. We took care, however, to inform him of the danger he was in of extreme pain and uneasiness from laying open the cavity of the joint; nay, that there was even a possibility of his being at last obliged to submit to an amputation of the limb in order to save his life. He was not, however, intimidated by this intelligence, so that, the operation being resolved on, I performed it in the following manner. Having stretched out the limb as much as possible, I divided the skin, for about half an inch, in a transverse direction, a little below the joint. I then introduced a very small lancet-pointed trocar, pushing it up at least half an inch or more between the skin and the capsule. After this I penetrated the capsular ligament itself. On withdrawing the trocar, the matter was discharged very freely to the very last drop, after which the canula itself was withdrawn, the finger being kept upon its orifice during the time, to keep the air from getting in, and the skin kept down with a finger of the other hand, so as to form a kind of valve, by which the air was effectually excluded afterwards. The wound was dressed with a pledget of caddice well moistened with Wade's balsam, its sides having been previously drawn together, and the dressing laid over it in several folds. The limb was then laid perfectly straight, and covered with cloths dipped in solution of sugar of lead, in an equal quantity of vinegar, spirits, and water; half an ounce of the salt, and four ounces of each of the

liquids,



liquids. The cloths were kept constantly applied, and he was not allowed to move his limb; but, on the third day, he began to complain of pain in the joint, not very great indeed, but, as he thought, gradually increasing. I examined the limb, and found no swelling; but, as he was greatly alarmed on account of the pain, I applied a blister on each side of the knee, and gave him an injection, by which he was greatly relieved; and by the use of another blister, and two doses of the compound powder of jalap, the pain was entirely removed, while the joint continued motionless, which it did for ten days. I then moved it with my hand, and allowed him to do so while in bed, which he did with very little pain. When the second blister was healed, I caused him to rub the joint with camphorated volatile liniment, and in six weeks from the evacuation of the serum, which measured twelve ounces, he had not only recovered his strength, but the entire use of his limb; and has continued well ever since, now a space of six years.'

THE following case illustrates the treatment of wounds, when followed by spasmodic affections. It shews, (and we believe it is very generally the case) that wounds, when these symptoms take place, seldom inflame or suppurate, and that the greatest advantage is to be derived from scarification and topical stimulants, with the view of inducing these actions.

'In July, 1781, I was called to a girl, who had got a large splinter of wood run into the ball of her right thumb, from the handle of a rake, which she was using in hay-making. The weather was very hot, and had been so for some time, the thermometer having generally stood at  $78^{\circ}$  for a fortnight before. The splinter, though almost an inch long, was easily extracted by some of her comrades; but, in twelve hours after receiving the injury, she complained of very severe pains shooting up her arm to the shoulder, attended with an uncommon degree of restlessness, and an uneasy feel about her neck, shoulders, head, and throat. She applied a poultice to the wound, and rubbed her arm with anodyne balsam, but without any effect. For the first  
twenty-



twenty-four hours, the symptoms increased gradually until, all at once, she was attacked with a very severe fit of the tetanus, on which I was immediately sent for. This was the second day after the injury was received; and, on examining the wound, which had been poulticed twenty-four hours, I found it still as flabby and relaxed as it had been the moment it was received. She complained, however, of most violent pain in it, affecting not only the whole limb, but the whole body; and these pains, she said, arose from spasms, which made the whole body, as well as the extremities, immoveable at the same time, though these abated a little every ten minutes, so that the disease was very evident. From the happy event of the former case I was encouraged to proceed in the same manner. The wound was immediately laid open through the whole length of the puncture, on the surface of which there appeared to be only a thin brownish sanies, something resembling that of a scrophulous bone; neither swelling nor tension appeared about it or the surrounding parts. I dressed the sore with pledgits dipped in equal parts of the tinctures of myrrh and bark; and, as she appeared extremely feeble and languid, I gave her one ounce of the tincture of bark; with half an ounce of cinnamon water, and fifteen grains of the powder of bark every two hours. In a few hours the spasms were so much abated, that she could rest for a considerable time; sometimes an hour together. For dinner, she had a mutton chop dressed on the gridiron, and for supper, an egg dropped in boiling water. The medicines agreed well with her; and in five days, from the time she was first attacked, her spasms ceased entirely, and she had no complaint but from the sore, which was not yet completely inflamed and suppurated. Her medicines were now given only once in four hours, and her diet was of the most nourishing kind; the sore was dressed like a simple ulcer; she continued to enjoy the most perfect health, and soon got entirely free from every complaint.



M E D I C A L and C H I R U R G I C A L  
R E V I E W.

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M A R C H 1796.

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ART. XLIX. *Discourses on the Nature and Cure of Wounds.* By JOHN BELL, Surgeon, Edinburgh.—large octavo, 476 pages, price 7s. 6d.—CADELL, London, 1795.

THE mode chosen by Mr. Bell of delivering his doctrines in discourses, is new, but at the same time, well calculated for combining instruction with amusement. We have all felt the advantage of being pleased as well as taught, and how much readier the judgment is improved, when addressed through the medium of the imagination, than by the unentertaining and tiresome recital of simple rules.—In the present performance, Mr. Bell has endeavoured (he remarks) to bring into one easy and comprehensive view, those lesser parts and operations of surgery, which are not found under that much abused title of a Compleat System. He has endeavoured to interest his reader in the manner of managing wounded arteries, and in many of the lesser points of practice. He has attempted to refute some favourite doctrines, not wantonly, but boldly; “not because they belong to this doctor or that professor,” but because they seemed to him totally inconsistent with true philosophy, and, what is more important, incompatible with sound surgery, in so far as it is as yet founded upon a knowledge of the powers and principles of the human body. He has used all that freedom with great

names which the cause of truth and science requires: He has done much in publick, which he could not allow himself to have said in private; for there criticism is no longer criticism; but the foul report and private malice of it works like a secret poison, against which there is no cure: He has criticised the opinions of those chiefly, who, being at the head of the profession, are of course the best able, and, by all appearance also, the most willing to defend themselves.

The first Discourse is *on procuring adhesion*. In this, the author speaks of the nature and means of procuring adhesion, its advantages, and time of introduction, which he justly considers as one of the greatest improvements of modern surgery.

The second and most important Discourse, is *on wounded arteries*. ‘Of all the sudden accidents’ (Mr. Bell observes) which demand the assistance of the surgeon, no one requires such absolute presence of mind, and such perfect knowledge of anatomy, as the bleeding from any great artery. I cannot conceive how a man of real feeling can, in our profession, pass one composed or easy hour, without knowing thoroughly the course and value of the great arterial trunks. Without this preparation, the surgeon lies continually exposed to accidents, which may in a single moment, ruin his professional character, and blight all his fairest prospects of success. Without this knowledge of the blood-vessels, a modern practitioner is much in the condition of one who lived in times before the needle was invented, when the surgeon durst not cut the most trifling tumour, or did it with fear and trembling; when often an operation apparently easy, cost the patient his life. But with a due preparation, even the youngest surgeon now knows how to speak in consultation, and how to perform his operations; where to be afraid, and where to venture upon a bold and resolute thing. The greater operations are easily done, while the cross accidents of practice are the only proper tests of the surgeon’s skill.



The chief questions, which demand discussion in this interesting subject, are:—

1. What is the real importance of a great arterial trunk in any limb? and what is the true value of its lesser branches, of its inosculating arteries, of those intricate connections, which in accidents of the main trunk, enable the smaller branches to supply and nourish the limb?

2. What is the form which a wounded artery assumes? How is it covered? What parts form that bag which we call Aneurism, and which, both from the danger of its bursting, and our fear of gangrene, is considered as a most dangerous disease? How may the operation, in this wound of a great artery, be most safely performed?

3. Or since even by bleedings from the smaller arteries, our patient sometimes dies, how should we manage these smaller arteries? The needle, the compress, the sponge, the styptic waters, are all of them used, rather, as it should seem, according to the fashion of the day, or to mere accident or caprice. But are there not certain accidents, or certain parts of the body, in which each of these will be found more or less serviceable, according to fixed and steady rules?

Under the first head, Mr. Bell criticises with much freedom the descriptions given by authors of the great arteries of the limbs. The size and importance of the inosculating branches, he remarks, have been much undervalued; which has led to a timid and imbecile practice, arising from a groundless fear of the insufficiency of these branches to carry on the circulation of the limb, when it has become necessary to tie the principal trunks. Thus, Mr. Bell observes, wounds of the femoral or axillary artery are often dangerous from bleeding, but never fatal from the want of inosculations; that we should tie the greatest arteries confidently, whenever they are wounded without the trunk of the body, and that we should tie the arteries as boldly at the groin or in the axilla, as the lesser branches going down the thigh or arm. Besides the sanction afforded to this

practice from a knowledge of the distribution of the vessels, several cases are brought forwards in proof of its propriety; from which we select the following:

“ A goldsmith of the name of Morellus, 55 years of age, consulted Guattani about opening a tumour in the groin, which all the other surgeons declared had come to a perfect suppuration. Morellus had during the whole winter, complained of a settled pain in the right groin, sometimes milder, sometimes very violent, but never absent; accompanied during the winter only with a degree of lameness, but now in the spring it had begun to swell. When this unlucky Morellus going along with others on the 4th of June to St. Peter's, to see the pompous ceremony of the consecration of the host, was seized suddenly with such dreadful pain, that he was obliged to go home; and partly from fear, partly from the violence of the pain, went to-bed, and lay for three months under the care of his physicians, their prescriptions all ineffectual, his disease increasing daily, and the unfortunate Morellus now almost hectic, was entirely confined to bed. There was great swelling of the groin, contraction of the thigh, (so that he could not stretch it out) and a distinct fluctuation of the groin, which extended from the symphysis pubis to the spine of the ilium, but still without tension immediately under the skin.

“ Guattani could not allow himself to believe this to be a proper suppuration, because the fluctuation brought no relief; and though there was no pulsation, he yet suspected aneurism, and explaining himself on this head to the consulting physician and surgeon, Amicio and Maximinus, both professors in Rome, they agreed to spend a few days longer in trying common remedies, partly that they might make a trial of such remedies, but chiefly to allow time for Guattani to make up his mind concerning the nature of this disease.

“ After fifteen days, they found no change, except a new suppuration within four finger's breadth of the great trochanter, and therefore resolved to do the operation, and to cut in the groin as the place the most favourable  
for



for stopping the flux of blood, in case of Guattani's fears about aneurism being well founded.

“ But lest the assistants or friends, and more especially the patient himself, should be alarmed with the sight of blood, Guattani talked over this subject with the patient, assured him that he had provided every thing for stopping the blood, explaining to him at the same time, how easy it would be to enlarge his small incision, in case of there being pus only in the tumor, and explaining also, that in case of pure blood flowing, he would presently give it a free exit, so as at least to empty the bag; and would let the fresh blood run still, even after the emptying of the bag, if his strength would bear it. After which, he pledged himself to secure the artery by compression, if he could only get his compress fairly put down upon the artery itself. After all this, says Guattani, I trust there will come on a good suppuration, and that you will be restored to perfect health; at all events, this is expressly what must be done, and all that can be done, to attain that desirable end.

“ Morellus heard me (says Guattani) with a composed mind, and we proceeded to our operation boldly; being provided with basons for receiving the matter, and compresses and bandages for commanding the blood. Then the surgeon Maximinus introduced his curved bistory delicately into the highest point of the tumour, near the crista ilii, where the skin was particularly thin, when instantly pure blood gushed violently out, to the great alarm of all present. But encouraging the patient, I took one of the basons (says Guattani) in my own hand, and extracted such quantities of blood by this small opening, that I filled one bason, took up a second, and still continued my work, till the pure arterial blood began to flow, and the patient to faint. The blood was stopped by Maximinus clapping his thumb upon the orifice; and Guattani, by graduated compresses one above another, with firm bandages, so suppressed the bleeding, that the patient did not faint, but, on the contrary, was presently relieved from all his fever and pain.



and being supported with cordials from time to time, he went on without bleeding, or any other bad symptom, and without their needing to touch the bandage till the 13th day, when the dressings being removed, nothing flowed from the wound but a little pus; which showed that the artery was fairly closed, and encouraged them to go on with the cure. Although the suppuration was not excessive, they were forced to make a counter opening, and accomplished the cure in a little more than two months. Now the coagulated blood at first, and the fresh blood after, the patient's feeling no lowness during the emptying of the bag, and his fainting when the pure blood began to run, prove this to have been an aneurism, and Guattani did wisely in allowing some of the arterial blood to escape, that he might have a greater command of the artery, and be enabled to compress it."

On this case Mr. Bell observes, that it signifies nothing whether this was or was not an aneurism; nor, if it were truly an aneurism, does it signify whether it were an aneurism of a branch only, or of the main artery of the thigh; nor whether the aneurism were above or below that point at which the *profunda* goes off. The question is, whether the main artery were stopped above the *profunda* by the violent compression which they needed to make? And this is solved by Guattani's reflections on the case.

" This case settles (says Guattani) two great questions which disturbed me very much; for in the first place, the pressure was such as to prevent the least drop of blood from passing down the artery; whence I was satisfied that the limb was nourished by the internal iliac alone; and since this aneurism was cured by compression merely, I am satisfied that compression will cure any aneurism, whether from wounds or from disease."

The author in the next place, speaks of the condition of a wounded artery; of the nature of a tumour which arises over the wound of a great artery; and of the way of operating in those recent aneurisms. Here Mr. Bell advises



advise that the surgeon should, if possible, perform the operation on the very moment of the wound; he should clap the point of his finger on the wounded artery, or make his assistant hold the artery; cut the wound so far open, as to enable him to see it fairly, and tie it. The surgeon may as well do so; for whether he determines by his reasoning that it is safe or dangerous to tie the great artery of the limb, still the circumstances of the wound are the same; and the artery, whether it be the great artery, or some secondary branch, whether punctured, or fairly cut across, is lost to that limb; and since the wound itself of a great artery cannot heal, its cavity must be closed.

The following interesting case exemplifies the mode of practice which the author deems it proper to pursue, better than the detail of his rules.—‘A poor man, who was by trade a leech-catcher, fell as he was stepping out of a boat, and the long and pointed scissars which are used in his business being in his pocket, pierced his hip exactly over the place of the sciatic notch, where the great iliac artery comes out from the pelvis. The artery was struck with the point of the scissars, it bled furiously, the patient fainted; and in so narrow and deep a wound, the surgeon, when he came, found little difficulty in stopping it up, and less difficulty still in making it heal. The outward wound was cured; the great tumour soon formed; and the man travelled up from the north country, where the accident had befallen him, and in six weeks after arrived in our hospital here with a prodigious tumour of the hip, his thigh rigidly contracted, the ham bended, the whole leg shrunk, and cold also, and useless, as if it had been an aneurism rather of the artery on the fore-part of the thigh.

‘The tumour was of a prodigious size, and by that very circumstance of its being one of the greatest aneurisms, it lost all the characteristics of aneurism, especially there was no pulsation, no retrocession of the blood when the tumour was pressed upon; there was nothing peculiar except this, that the great and sudden distention

was the cause of great pain, and from the continual pain, lameness, and hopes of a cure, he was ready to submit to any thing, beseeching us to operate.

‘ There was little doubt of its being a great aneurism, but there was a possibility also of its being a vast abscess; and it was resolved, in consultation, that he should be carried into the operation room; that a small incision should be made, that the skin being cut, the bag itself should be just touched with the point of a lancet; if found to contain matter, it should then be opened: but if blood, that it was then to be considered as an aneurism of so particular a kind as to entitle us to call for a full consultation.

‘ I made an incision two inches and a half in length; the great fascia in the hip blue, and very strong, formed the coat of the tumour, and under that were seen the big fibres of the great glutæus muscle. The knife was struck into it, and large clots of very firm black blood rolled out by the tenseness of the tumour, which began to emit the clots in this way, the moment that it was opened at one point. There was one thing further desirable before we put the patient to bed, that we should understand the case so far as to be able to report to the consultation whether the artery was absolutely open, and whether it was the great artery of the hip. I continued therefore (knowing that the opening I had made could be covered with the point of the thumb) to pull out a few more clots of blood, till the warm and florid blood began to flow; I then pushed in a tent-like compress into the small wound of the tumour, (viz. of the fascia) laid a broad compress over the outward wound, and put the patient to bed, with one of the pupils holding the hand upon his hip.

‘ This was done at one o’clock, and at four the consultation met, and the operation was performed. And in my notes I find two steps of the operation chiefly marked: 1st, That upon our opening the tumour fully with an incision of eight inches long, and turning out the great clots, the blood was thrown out with a whizzing  
noise,



noise, and with such impetus, that the assistants were covered with it, and in a moment twenty hands were about the tumour, and the bag was filled with sponges and cloths of all kinds, which had no better effect than the cloths, which in any accident, the friends in great confusion wrap round a wounded arm; for though the blood was not thrown in a full stream, nor jets, it was seen rising through the edges of the incision; it floated by the sides of the cloths, which were pressed down by the hands of the assistants. But we knew it also by a more alarming sign; for the man, who was at first laying not flat, but supporting himself on his elbows, fell down, his arms fell lifeless and without pulse over the side of the table, his head hung down and was livid, he uttered two or three heavy groans, and we believed him dead.

‘ Seeing in this critical moment that if he was to be saved, it was to be only by a sudden stroke, I ran the bistory upwards and downwards, and at once made my incision two feet in length. I thrust my hand down to the bottom of the tumour, turned off the great sponge which was over the artery, felt the warm jet of blood, put the point of my finger upon the mouth of the artery, and then I felt distinctly its pulse, and then only was I assured that the man was still alive. The assistants laid aside the edges of the prodigious bag, and sought out the several smaller sponges which had been thrust in, and the bag being deliberately cleaned, and its edges held aside, I kept the fore finger of my left hand steady upon the artery, passed one of the largest needles round under my fore-finger, so as to surround the artery; one of my friends tied the ligature, and then upon lifting the point of my finger, it was distinctly seen, that it was the posterior iliac artery, and that the artery had been cut fairly across, and had bled with open mouth—that it was cut and tied exactly where it turns over the bone; and although the extremities were cold, the face of a leaden colour, and the man had ceased to groan, and lay as dead; though the faint pulsation could not be felt through the skin, in any part of the body; we saw the  
artery

artery beating so strongly, whenever I lifted my finger, that we were assured of our patient's safety; however, he was so low, that after laying down the sides of the sac, and putting bandages round his body to keep all firm, we were obliged to have a bed brought in, and having given him some cordials, we left him to sleep in the great operation room, attended by the pupils and by nurses.

‘ He was cured of this great wound in less than seven months, although his cure was protracted by the foul suppuration of such a bag, and by the exfoliation of the ilium and sacrum, which spoiled, not so much from their having been laid bare by the last sudden stroke of the knife, as by the aneurismal blood having lain upon them; the exfoliations were very large, and the sacrum especially continued exfoliating to the very day on which the wound closed.’

There is one thing, the author observes, more distressing to the surgeon, than all the difficulties of the operation; the artery after it seems to be secured, often gives way, from an indisposition in its sides to unite. This may be owing to that change which the whole arterial system is found to have undergone in advanced life, their coats becoming thickened, brittle, and fragile. The return of bleeding may likewise be occasioned from the use of too large a ligature; the knots which have been made have sometimes been of larger diameter than the artery itself when compressed; or the ligature may become slack by the wasting of the flesh included along with the artery. Mr. Bell thinks however, that this accident often is owing to the haste or unskilfulness of the surgeon not having effectually applied his ligature; he therefore recommends us to dissect the artery clean, that by being distinctly seen, it may be fairly tied, as free from the surrounding parts as possible.

The third Discourse is on the bleedings from the smaller arteries, by which he means those of the second order,



order, as the arteries of the fore arm or leg; not so large as to produce great and dangerous aneurisms; but still of such importance, as sometimes to occasion the patient's bleeding to death. In all these cases the author justly insists on the use of ligatures, instead of vainly trusting to styptics. In arteries of a smaller order, and lying firm against some bone, as in the hand, or foot, or temple, compression will in general be sufficient, by bringing the sides of the vessel into contact, and thus causing them to unite.

When an oblique wound touches an artery, where it lies deep under the fleshy bellies of many strong muscles or close betwixt two bones, upon their interosseous membrane, as in the arm or leg, the case is peculiarly distressing.—A ball passes along the fore-arm, rakes along the two bones, wounds the radial or ulnar artery in the bottom of a deep and narrow wound, and then passes out beyond the elbow, making an opening too small to let out the blood; or we will suppose the oblique stab of a knife, sword, or bayonet, touches an artery, lying thus in the heart of the fore-arm, under all the muscles, and close upon the bone; then the following consequences ensue. The profuse bleeding at first, proves that some artery is wounded; the direction of the wound should ascertain which artery it is. The stopping of the outward bleeding, causes an internal aneurism, different from the greater aneurisms of the arm or thigh, as it lies not under a fascia, forming a fair circumscribed aneurismal bag, but under the bellies of all the muscles, which are separated from the bones by a very irregular and a very dangerous collection of blood. The outward bleeding is soon stopped by compresses, and a bandage; the friends are less alarmed, seeing nothing but a narrow slanting wound; but when the next morning, they see the arm black with the injected blood, and swelled to an enormous degree, their fear is like their indifference before, quite ignorant, and beyond the true measure; they believe this to be an absolute gangrene, and that the patient is lost; while



while the surgeon sees in this blackness not the signs of gangrene, but the marks of a wounded artery, and foresees a difficult and tedious operation of seeking it out. But if again the surgeon have not the skill to foresee all the dangers of the case, the apparent gangrene is soon changed into a real one; the limb becomes cold, benumbed, and has a livid redness upon its surface, the skin without runs into a low inflammation; the blood within increasing every day, corrupts and bursts out; and this is not merely by the wound of its great artery, and by losing the great trunk that nourished it, that a limb is lost; but in a case like this it is lost by the deep driving of the blood among the flesh and bones. Either the outward bleeding is allowed, and the patient is in danger of immediate death; or the blood is confined, and the bleeding goes on within; so that every time the artery bursts out, the limb is injected anew, as it were, by the arteries, and is in imminent danger of gangrene at every new effusion of blood. The matter is bloody, fetid, corrupt; it prevents the reunion of the bones, (if any bones are broken) makes foul suppurations, and extensive fetid sores; and each new suppuration is succeeded by a dissolution of those clots which had for a time stopped up the artery, so that again the blood bursts out; till at length, after many months of suffering, the patient is forced to part with that limb which he has undergone so many dangers to preserve. The extension, sinuses, and foul sores, the disorder of the joints, and the total caries of the bones, makes every such case incurable; so that there is, even from the very first moment, no other alternative for the surgeon, than either to perform immediately a bold decisive operation, or to resolve at once (not keeping the patient in this lingering condition) to cut off the limb; and to the patient himself the questions may be honestly proposed in these terms: “ Will you have this tedious but necessary operation, of tying the artery, regularly performed? Or will you, to shun a present pain, linger for months in  
this



this miserable condition, consenting at last even to lose the limb, when it is perhaps too late to save your constitution, or even your life?"

On this head, Mr. Bell points out many glaring errors, in the writings of authors of the first eminence.

This section also contains a curious history of the different opinions which have been entertained on the stopping of hæmorrhages.

The next discourse is on gun-shot wounds. There has been generally, the author observes, a mystery in the business of gun-shot wounds, arising from the strange notions which the older physicians entertained concerning the nature of shot. The blackness observable in wounds of this description was by some attributed to the heat of the ball, believing every gun-shot wound to be a burnt wound; whilst others believed, that the powder was of a dangerous nature, and that a ball made of necessity a poisoned wound. Almost every doctrine has drawn after it some peculiar practice, good or bad, dangerous or useful; and this pernicious doctrine of there being some kind of poison in a gun-shot wound, has been the root of all the harsh practices and cruel operations of the older surgeons: for, in order to subdue this poison, they made deep incisions, applied the actual cautery, burnt the wounds with turpentine or hot oils; and the physicians, who took the direction in those days, would not in any circumstances allow the surgeons to bleed, lest the poison should be thus drawn back into the veins.

This pernicious practice was at length opposed by Paré, and mild and simple applications adopted in place of those of a contrary nature. "I had heard of nothing," says he, "so often as of the poisoned nature of gun-shot wounds, and had read both in De Vigo, and in Guy de Chauliac, of the ways of burning them with boiling oils. When the French armies made their way into Piedmont, many of our soldiers, says Paré, were wounded in the smaller garrisons: and I saw the army  
surgeons

surgeons using these terrible cauteries, and I also followed the common practice, and dressed the wounded with boiling oils, until all my oils were expended. On the night on which this happened, I dressed my wounded soldiers with oil of roses, and turpentine, with whites of eggs. I went to bed much oppressed, with the apprehension that all these poor fellows would be found in the morning poisoned and dead. I arose therefore betimes ; and learnt, to my infinite surprise and pleasure, that they had slept well and easy ; without any pain, or swelling, or redness about the wounds ; while those of my soldiers, who had been cauterized with the hot oils, had great fever, and swelling, and excruciating pain." This fortunate accident determined Parè in favour of the milder dressings, and was most probably the cause of all his future success. " I have," says Parè, " been in my time chief surgeon to six warlike kings of France, often in battles, and often shut up in besieged towns : for thirty years I have never used these burning oils, and I have never lost one patient, whose death could not be fairly accounted for by his bad habit, or by a contagious air."

There is another curious anecdote, connected with this reformation of Parè's practice, which both shows the ignorance of the age he lived in, and demonstrates in a particular manner, that those among the cauterizing surgeons, who used milder dressings, were sure of acquiring a high name.

After the taking of Turin, Parè insinuated himself into the good graces of a man, who had a high character for curing gun-shot wounds ; and having attended this surgeon, for two years, Parè, when about to leave Turin, prevailed upon him to disclose this great secret. He made Parè gather a pound of earth worms, and procure two living dogs ; he infused the earth worms in white wine, and put the live dogs into boiling oils, till the flesh separated from the bones ; then mixing them, he made a mild ointment ; and this, he took a sacred oath, was the balsam with which he performed such wonderful cures. The " oil of whelps,"



(for *oleum catellorum* is the name he gives it; by which it was long known and much used by all the surgeons in Europe) would make a strange figure in a dispensary list; but we find Parè often prescribing the earth-worms, and boiled whelps, as an excellent mild application for softening and bringing off the eschars, and for easing the wounds. No doubt this prescription, though ludicrous in some respects, was infinitely preferable to boiling oil, and was really (bating the oddity of the thing) a good medicine. Parè used it with great success, and the inventor of this foolish, but mild ointment, had got an established reputation by it; Parè recommended these mild dressings so effectually, that the chief surgeons of his time followed his example; and thus ended the practice of hot turpentine or boiling oils.'

It is not then, Mr. Bell observes, because gun-shot wounds are poisoned or burnt, that they shew their malignant nature, but it is because they are bruised, that they gangrene: it is because they do not bleed at first, that their after-bleeding is so dangerous; it is because they are deep, penetrating, and bruised, that they appear malignant, and do not easily heal: and their peculiar nature draws after it a peculiar practice; for it is to open this narrow wound, to unload the pent-up vessels, and to quicken the falling off of the bruised parts, that we scarify so deeply; this scarifying converts such a wound, in some degree, from its peculiar nature as a gun-shot wound, to that of a fresh open and bleeding wound.

After premising these general observations on gun-shot wounds, Mr. Bell descends to particulars. He first speaks of the proper method of examining a gun-shot wound; how to guess at its direction, to prognosticate its event; to declare whether any of the viscera, or any great vessel or nerve be wounded.

Secondly. How to scarify a gun-shot wound, so as to open its vessels, loosen the bruised parts, and leave a free opening as a drain for the matter, or for the extraction of the ball.

Thirdly,

Thirdly. Of avoiding the arteries, or tying them when cut; and,

Fourthly. He gives rules for the extraction of balls, cloaths, splinters of bone, or of any foreign bodies, which might prevent the healing of the wound.

With regard to the scarifying gun-shot wounds, he opposes the opinion of Mr. Hunter, who thought it an unnecessary practice.

The following general rules comprize the author's opinions on the subject of gun-shot wounds. — 1st. ' In wounds of the viscera, you are not to introduce your probe with that unfeeling boldness, which makes every repetition of the practice a stab; use your finger only; use that, too, sparingly; trust rather to the eye; look at the general condition of the patient, and the course of the ball; wait quietly for the symptoms, and be guided by them.

' Probe with greater freedom and boldness on wounds of the limbs, and search carefully for the ball, or cloth, or splinters of bone; for your future operations are successful only in proportion as the condition of the wound is well understood. But if the patient have lain long upon the field, or have been carried in a waggon; if from any cause his wound be already inflamed, you must refrain from searching; for it is too late to extract the ball, and you must wait (laying the limb easy) till the suppuration be formed.

' The common term, " scarifying of gun-shot wounds," is an unlucky one; for we use a word which implies but superficial cutting, to explain what it never can explain, a deep and bold incision, for extracting broken bones, or for tying wounded arteries; which must be made large, in proportion to the size of the limb, not superficial through the skin only, but also into the fascia, which binds the muscles; sometimes it must go down also among the muscular flesh. There may be required three incisions in a large wound; there must be two in every wound which passes through a member; there must be a wider incision where the ball



ball is lost in the limb; and the single incision should be so freely made, as to change the wound from one penetrating and wide at the bottom, to a wound quite open and much larger at its mouth; or, in plain terms, it is in proportion to its deepness, that we open the mouth of a wound.

• If there be bleeding from a gun-shot wound, you are sure that it is no common bleeding; that it comes not from the smaller arteries, which are too much bruised to bleed, but from some great vessel, which you dare not for a moment neglect: you must apply your tourniquet, make bold incisions, and look fairly down into the bottom of the wound, that you may apply your ligature surely; and since a gun-shot wound is in general bloodless, the want of bleeding is no security that no great artery is hurt; for if the ball has brushed off from the artery, as from the other bruised parts, there will be a breach in its side: therefore, whenever a great artery is hurt, you must take measures not to be surprized, if, in putting in your finger, you have felt the beating of such an artery from the wound, you must watch with care from the fifth to the fiftieth day; watch always, while the sloughs are falling off; and a beating, or throbbing in the wounded limb will often forewarn you of the danger.

• Instead of using setons or tents, to keep the wound open, you should seek relief from free incisions; and, instead of hot and spirituous applications (which used to be put to those wounds, when they were thought to be poisoned, the lips looking gangrenous or livid) lay the wounded limb in large poultices, easy and soft, which will at once encourage a kindly suppuration, and alluage the pain.

• You will see that there is no dressing peculiar to gun-shot wounds; that they are peculiar, rather, in admitting of none. The French surgeons used to employ themselves and attendants in rolling long bandages with curious neatness, and intricate reverses and turnings, which, though they might keep up the parade of

surgery, occasioned so much pain to the patients, that they were ridiculed even in the French academy, and by their own great surgeon Le Dran. There are now none of these bandages used, which you see so finically drawn in books; no setons are drawn through the wounds loaded with medicines, always of doubtful, sometimes of a very mischievous and irritating nature; no spirituous applications, which might be considered as the real poisons, nor any burning with caustics, or oils, which indeed they used hot enough to melt the very ball with which the wound was supposed to be burnt; we do nothing now but wrap the limb in a large soft, warm, and comfortable poultice; in short, we in Scotland, call a poultice a bath; and if you will make every poultice, literally, a bath for the limb, you will do your patient great *justice*.

In the next place the author treats of wounds of a different description; these are, cuts of a sabre, stabs of the bayonet, or thrusts of the small sword. They differ in all essential points from the former; are not bruised or gangrenous; nor dangerous from after-bleeding, nor tedious from casting off sloughs; there are no motives for scarifying; nor are there any painful extractions of foreign bodies; no slow exfoliations, nor irregular suppurations, nor new abscesses appearing just when the wound should heal. But, on the contrary, sabre wounds are easily reunited, like the flaps made by the surgeon's hand; and even bayonet-wounds among the viscera are so very different from gun-shot wounds, that when the first dangers are over we pronounce them safe; 'nay,' observes Mr. Bell, 'I shall have occasion to explain to you, upon rational principles, some recoveries from bayonet-wounds, which look more as if they had been owing to the art magic, than to regular surgery; recoveries of men whose breasts had been fairly transfixed with the weapon, and the wound managed in so peculiar a manner, that they have



have been walking in the streets, found and well, in a few days.'

Having spoken at length of the surgery of wounds, Mr. Bell proceeds to their medical treatment; a subject of equal, if not greater, importance, than the former. Here he lays down his rules for conducting the patient through the dangers which follow the accident; by bleeding, while in danger of inflammation; by rich diet and wine, while undergoing a long and weakening suppuration; and by bark, when gangrene is likely to come on. He endeavours to explain all that hurts or heals his wound, and all that endangers his general constitution, or keeps it safe; for upon these matters, more than upon the immediate wound itself, depends the patient's safety.

The general doctrine on this head, is contained in the following rules. — 1. When your wounded patient is first brought to you, he is in great confusion; there is a tremor, a tonic stiffness, or almost a convulsion of the whole frame; there is a coldness, fainting, and nervous affection; but it is merely a nervous affection, and you should treat it as such. You may expect it to subside in time, and therefore should give some warm cordial and large opiates to quiet the commotion: this is no time for bleeding, whatever the nature of the wound may be. If the stupor continue, you should give cordial draughts, and wine.

2. If this nervous commotion being quieted, a sharp fever should come on, still do not bleed, but rather be upon the reserve; for perhaps this, which at first seems to be a pure inflammatory fever, may turn out to be a fit of an ague, to which the patient may, perhaps, be subject; it may be a low and malignant fever; it may be an attack of some camp disease; and if a diarrhoea, great weakness, and low muttering delirium, should come on immediately after you have bled your patient freely, you would be distressed at the thoughts of what

you had done ; and you would, indeed, have much to answer for.

3. Reserve your bleedings for those more dangerous cases, where high inflammation is so often fatal, and do not bleed in wounds of the hips, shoulders, or limbs ; reserve bleeding for wounds of the breast, or belly, or great joints ; for in all wounds of cavities, inflammation, which can hardly be escaped, is the great danger.

4. If a man be wounded after a full meal, there can be no doubt that a gentle vomiting must be useful, where it is allowed by the circumstances of the wound. The old physicians found their advantage in it, and ascribe the good effects of vomiting to the preventing of crude and ill concocted chyle from entering into the system, so as to kindle up a fever. There is no doubt, that a meal, which was no load during health, will be a great oppression upon a disordered system, and the carrying it off must be a great relief ; although the old physicians, by talking this useless jargon about ill-concocted chyle, might almost provoke us to reject both the doctrine and the practice. The system cannot be weakened by a gentle emetic ; and if the system should fall low after vomiting, it were easy to substitute a fitter support and better excitement than that of an oppressed stomach and loaded intestines, by first discharging these crude meals, and giving, when the stomach is emptied, easy food, and cordials suited to the condition of the system.

5. But in every wound there comes a period of weakness, in which we repent of every bleeding that we may have made, even when it was really needed ; a period in which, by confinement and pain, occasional fever, diarrhoea, profuse suppuration, or colliquative sweats, the patient falls so low, that it is not easy to support him through the cure ; and thus there are two great principles in the treatment of gun-shot wounds, that even at first we should be sparing of blood, and that the period of weakness which is to succeed, is the greater



greater danger ; on this single point hangs all the practice.

This concludes the first part of this very ingenious treatise. The second part treats of particular wounds ; and an account of this must be reserved for a future number of our Review.

ART. L. *An Inquiry into the History, Nature, Causes, and different Modes of Treatment hitherto pursued, in the Cure of Scrophula and Cancer.* — By WM. NISBET, M. D. — 8vo. 263 pages, price 4s. 6d. — KAY, London, 1795.

THE present publication contains nothing, either with regard to novelty, or judicious arrangement of previous facts, that entitles it to particular notice. We shall not therefore detain the reader with a detailed account of it. The two diseases of which it treats have hitherto eluded the search of the physician after their true nature ; nor is any part of the veil under which they have lain concealed, withdrawn by the treatise before us. After enumerating the several external appearances of scrophula, the author mentions hydrocephalus, mesenteric, and pulmonary consumption, as internal species of the disease. Whether the reasons for placing the first of these under the head of scrophulous affections, as given in the following passage, be satisfactory, we leave to the reader to determine.

“ As this disease (hydrocephalus) occurs chiefly in children, and in families who shew evident marks of scrophula, *it must be considered* as an affection of this class, and as arising from that laxity and loss of tone, conspicuous in every part, which, in this case, particularly affects the vessels of the brain ; while the effusion poured out, is to be regarded rather as a consequence than a cause of the disease. A stronger confirmation, also, of the scrophulous nature of this affection,

may be adduced from this fact, that several remarkable instances of pulmonary consumption, and a similar affection of the head, in more advanced life, have been known to alternate with each other; thus shewing themselves to be various modifications of the same malady."

On the subject of the theory of scrophula, having mentioned the different opinions which have been held by different authors, Dr. Nisbet offers his own opinion, which is, 'that scrophula is a disease arising from a peculiar morbid state of surface, most prevalent, therefore, in the early period of life. That this state of surface is, at the same time, connected with general laxity, flaccidity, and often irritability of the system; and that the disease may arise in any constitution where these circumstances exist in a high degree. That, in this state of surface, inflammation attacking any part of the mucous membrane, it passes into ulceration, and the matter of this ulceration being absorbed by the next lymphatic glands, the peculiar form of the disease, or the lymphatic swelling, next takes place; and this matter, then elaborated in the lymphatic gland, acquires the peculiarity which renders the discharge scrophulous, or constitutes the peculiar acrimony of the disease. This inflammation of the mucous membrane is often so slight, as hardly to be noticed, and the succeeding swelling of the lymphatic gland is considered as the *first* symptom of the disease, and never thought to arise from the former cause. The affection of the lymphatic gland then, is properly the *second* stage of the malady; and as the matter originally absorbed, is not so acrid as the venereal and others, nor the gland itself endued with much sensation, the progress of the disease, in it, is for a long time slow, till it acquire a certain size, and affect the external teguments: When the disease arrives at its height, and a rupture of the teguments takes place, a peculiar matter seems then to be formed, possessed of various degrees of acrimony, from simple serosity, to that of acting as a real solvent of the animal fibre.'



On the treatment of scrophula we meet with nothing new or satisfactory.

Speaking of cancer, the author observes on the general state of the blood, that ‘in the real cancerous predisposition, wherever the fluids are subjected to experiment, it has been found by authors, that the *crassamentum* is extremely loose, and that a superabundant ferosity prevails. This ferosity is also impregnated with a strong saline principle, which would seem, wherever deposited, and allowed to undergo the changes induced by inflammation, to act as a solvent. It is this principle we are to consider, as in some measure the basis of that deleterious matter which is afterwards produced, and corrodes every part that comes within its action. This loose state of *crassamentum* is confirmed by the great tendency to hæmorrhage in all cancerous cases; by the difficulty of stemming the blood which points out its very fluid state; and still farther, by the small quantity of coagulable lymph which appears in it, when allowed to stagnate.’

The following are the author’s ideas on the theory of cancer. ‘The *only theory*, and the *most rational*, that remains for us to adopt, founded on dissection, and the phenomena of the disease, is, that cancer consists partly in a *destruction of glandular organization*, and partly in a *vitiating action of vessels*. The former evidently appears from dissection, in which nothing but a *confused jumble* of parts is to be traced; while the deleterious nature of the discharge abundantly confirms the latter. This *deranged organization* may be considered as the true previous characteristic of cancer, being the consequence of an obscure, or what may be termed the *carcinomatous inflammation*, exerting itself in the part, and solely confined to its vessels. This deranged organization becomes, in time, formed into a *hard indissoluble substance*, not far distant from the nature of bone, and compared, by many authors, to the nails, and even horns of animals. This substance, taking on acute inflammation, can

can neither be resolved, nor does it suppurate; the latter process requiring a certain softness of texture. From these circumstances, on its bursting at last, and the exposure of its internal surface to the atmosphere, a *gangrene* of a *slow* or *chronic* nature must necessarily ensue; and as *compactness of structure* prevents *exfoliation* of a tooth, when carious, so here *obliteration of arrangement*, particularly of vessels, and *hardness of substance*, prevents a union of parts and natural growth, to stop its progress. From this view, *schirrus*, however formed, may be considered properly as *an extraneous body*, which cannot unite with the sound parts by any means whatever, and which nature intends, by exciting acute inflammation, and bursting the teguments, to throw off. This, in some rare cases, has actually happened; but as its connections, for the most part, cannot be loosened, the atmosphere then acts upon it; and, instead of the intention of nature being completed, a deleterious matter is formed from its substance by a *process similar to gangrene*, not ulceration, for in ulceration there is no obliteration of vascular structure; and this process brings the *neighbouring glandular parts* into the same state, and thus perpetuates the disease. Hence cancer may be defined, “*A poison produced by a partial vascular obliteration, generated in a certain state of acrimony, for the most part of the fluids of the system at large, and under a vitiated action of the remaining vessels of the part.*”

‘Such is the theory to be collected from *dissections* of this disease, and a review of the *inefficacy of practice*; and it will apply, in general, to the ultimate stage of hardness, and the consequent ulcerations which ensue. In all their theories of the disease, authors have hitherto taken too contracted a view of it, and by referring it to the state of the fluids alone, they have overlooked the respective share that both solids and fluids have in its production.’

Few, we believe, will think themselves much enlightened in their ideas of the nature of cancer, by the preceding passages: nor do these reflect any new light



on the method of treatment. The author has brought forward fairly whatever has been recommended for the cure of this dreadful malady : extirpation, however, he is more an enemy to than the generality of practitioners. He concludes his essay with the general remarks which follow. It is anxiously to be wished, that his idea of the curable nature of those diseases in so large a proportion as he suggests, were verified. Of this, however, we confess ourselves to despair.

‘ In the first disease, or scrophula, I can say with confidence, that all the external forms of the malady, either of swelling or ulceration, affecting the soft parts, may be removed with ease and certainty ; and of the internal forms, that pulmonary consumption, taken before an advanced period of hectic, may, in the greater number of instances, be cured. In order to accomplish these desirable ends, a different opinion on the nature of scrophula must be formed, from what has generally been held out. I conceive that this disease is particularly marked by a defect of animalization ; and to remove this, the application of medicine will be useless without the aid of regimen. The general debility and flaccidity of the system, so often taken notice of, the crude watery secretions, and the indolent torpid inflammation, are all strong proofs of what I alledge. The solids want their due vigour to give the fluids their proper constituent principles ; and the latter seem to have a defect of that vitality, on which their action on the vascular system, or their effect on the solid parts, appears to depend ; for it is clear, they are to be considered as something more than inert fluids ; and if a reciprocal co-operation betwixt the solids and fluids is necessary to health, the latter are certainly, in this disease, defective in their powers.

‘ In the treatment of scrophula, we have seen that authors have attended, either simply to the state of the solid, conceiving that by invigorating it alone, a cure was to be effected, and an alteration of the state of the fluids to ensue ; or they have attended solely to the state  
of

of the fluids, on the idea of throwing out, or correcting, a noxious matter contained in them, that formed the principle of the disease ; but, in treating scrophula, I maintain, that though the state, both of solids and fluids, claims an equal share of attention, and though we cannot disjoin them, in a certain degree, from each other, yet it will be proper to consider them as unconnected, and to direct a separate plan of treatment for each in conducting the cure. With these observations, then, on its nature, the first step in the removal of scrophula will be, to direct a regimen capable of giving that vigour to the solid which it wants ; and also to convey to the fluids that share of vitality which they are naturally intended to possess.

‘ If a particular regimen, as I contend, is so useful in scrophula, it is still more so in cancer, being the first and great foundation towards a cure, without which all the other means employed will prove ineffectual. This has been little attended to by authors, except in a general way ; and in such a way it has seldom been much regarded by their patients. If a defect of animalization prevails in scrophula, I conceive that a state very opposite takes place in cancer. The crude watery secretions of the former constitution yield here to a highly *saline* and *ammoniated principle* pervading every part, and producing, in the seat of the disease, an obscure, or carcinomatous inflammation, having a tendency to unite the too rigid fibres ; and the situations of the disease, are generally such, as are not influenced by the action of the heart, so as to counteract it. To obviate this state, regimen, not medicine, must act. Pouteau is the first author who pointed out this. All acrimony, it is an established fact, is relieved by liquids ; hence, the reputation of different watering places, in many of the most incurable diseases. Medicine must be combined with it, to exert its powers in all those maladies which are intimately interwoven with the constituent principles of the constitution.



Next to regimen, the removal of local congestion is an important step. Mr. Fearon, finding beneficial effects from it, has carried his ideas too far, conceiving it capable of accomplishing a complete removal of the disease. In dissection of cancer we have seen, that every mark of inflammation prevails, of an inflammation, indeed, of a peculiar nature, whose symptoms are not acute, but whose effects are equally strong in inducing an altered organization of the part ; or producing the same morbid changes as acute inflammation, viz. adhesion, thickening of membrane, and apposition of new substance. The removal of the congestion, then, will lessen the strength of this inflammation ; the altered organization will proceed more slowly ; the contiguous parts will not be so liable to assume the morbid irritation ; and thus joined with the regimen recommended, one farther step will be joined to the cure. The benefit of this practice in cancer I would compare to the use of evacuants in intermittents, previous to the exhibition of the *bark*. If this medicine is given without them, we find, from the testimony of the first physicians, that obstructions of the liver, and other viscera, arise ; as a prelude to the action of specific remedies, the removal of local congestion must then be attempted, which lessening the force of the disease, will render the application of medicine more speedy, safe, and efficacious.

I have thus laid down some general principles, by which it will be understood how I proceed in the treatment of scrophula and cancer. I shall enter into no farther detail at present. The result of this practice, whether good or bad, I pledge myself to lay before the public, at no distant period, in the form of an Appendix to the present work. From it they will be able to form an opinion, which, I flatter myself, will not be unsatisfactory. Cases of every disease will occur, it is well known, to baffle the power of any treatment whatever ; but if, by the plan of cure suggested, in a disease so deplorable as cancer, while yet in its occult state, nine out of every ten cases shall be saved from the present  
cruel

cruel mode of procedure, my labour, I shall consider, amply rewarded. In the ulcerated stage, the proportion will not be so considerable ; but still much may be done to mitigate, if not always to cure.'

That such may be the case we ardently wish: but we possess too large a share of scepticism to believe it, till the proofs are exhibited.

ART. LI. *A Second Dissertation on Fever, containing the History and Method of Treatment of a Regular Tertian Intermittent.* By G. FORDYCE, M. D. &c. 8vo. 156 pag. price 3s.—JOHNSON, London, 1795.

**I**N a former number of our Review\* we had occasion to speak in terms of much respect of Dr. Fordyce's Dissertation on simple Fever. We confess ourselves no less gratified on the perusal of the present volume. We find the same marks of accurate discernment, and judicious discrimination of facts, which characterized the former work: we shall endeavour, therefore, to present our readers with as complete an analysis of it as the limits of our work will admit.

In this dissertation the reader will find only those appearances which are necessary for constituting a regular tertian described, and the manner of treating them pointed out; all accidents, or other diseases, which sometimes take place during its progress, are purposely omitted, such as hard tumours in the abdomen, dropsy, &c. It is the intention of the author to give an account of these in a future Dissertation.

The author defines a regular tertian, 'that case of fever recurring by paroxysms, in which each paroxysm goes through its three stages in the space of less than twenty hours, and returns nearly at the end of forty-eight hours from the beginning of the former paroxysm;



ysm; and where nothing happens excepting those appearances which are essential to the fever.

From observing, that when symptoms of the first stage of fever, such as languor, pain in the small of the back, head-ach, some foulness of the tongue, &c. remain after the crisis of a paroxysm of fever, after a certain time, a new paroxysm takes place, at least nine times in ten, Dr. Fordyce thinks it probable, that one cause of the return of the second paroxysm of an intermittent is, that the crisis of the first was imperfect. If a regular tertian has gone through many paroxysms, it will in general recur, although the crisis be complete, and no symptom of the first stage remain. A man who has been attacked with an intermittent at some former period, on the fresh taking place of fever it will assume the type of the former, which the author considers a proof of the power of habit in the constitution.

When a paroxysm of fever goes off, leaving some symptoms of the first stage after the crisis, it oftener returns at the beginning of the forty-ninth hour from the beginning of the former paroxysm, than at any other period. For this no account can be given. Although tertians are not uniformly so exact, yet twenty fevers at least return between forty-six and fifty hours, for one which recurs at any other period, excepting at the end of twenty-four or seventy-two hours. Those fevers which recur before the forty-eight hours, are called anticipating, those after, retarding tertians.

An anticipating tertian shows in one circumstance the strong indisposition of a fever to take place between eight at night and six in the morning. If an anticipating tertian should have its first paroxysm at two in the afternoon, its second at noon, its third at ten in the morning, its fourth at eight, its fifth will sometimes take place at six in the morning, sometimes at eight or ten of the evening preceding. A retarding fever is similar in its recurrence; if its first paroxysm should happen at ten in the morning, the succeeding ones at twelve, two, four, six, eight; the following one often  
does.

does not take place in the night, but at six or eight the next morning. It is not meant to say that the paroxysms never return regularly in the night, but that they recur much more rarely in the night than in the day; perhaps in a proportion of ten for one. It is entirely unknown what this depends upon, indeed the observation has been little attended to by any author who has not frequently seen the disease.

The intermissions from being imperfect at first, become gradually quite perfect, perhaps at the end of three weeks, and continue so for about six weeks or two months. If they are perfect, and if the patient be managed properly, no debility in the system will take place. After this period the intermissions become again imperfect; but the attack is much less severe, and thus the disease gradually abates for the space of two, three, or from that to six weeks, at last leaving the patient entirely, but for the most part weakened. The whole, therefore, of the disease occupies about four months naturally. Sometimes during this course, a more violent paroxysm will occur, and carry off the disease.

The author takes notice of the power of a regular tertian, in frequently carrying off other diseases, as rheumatism, affections of the stomach, habitual inflammations, or cutaneous eruptions, epilepsy, hysteric affections, and all other diseases which have become habitual.

The author has frequently ascertained by minute examination, that the blood of a man afflicted with a regular tertian, seldom differs from that of a man in the most perfect health. Neither is there any difference in the appearance of any of the solids or fluids of the body, during or after the disease, excepting that the tongue, during the paroxysm of a tertian is covered with the crust described in the former dissertation; and a lateritious sediment takes place in the urine, in the crisis, which consists of matter found in the urine of a man in health. After a tertian has gone through its regular course, no difference in the blood has been found  
upon



upon the investigation of its properties, or any of the other fluids, from those found in a perfect state of health.

The author has therefore never seen nor can himself conceive any cause why a simple paroxysm of fever should go through its three stages, and terminate in health; much less why a regular tertian should begin, grow gradually more perfect, continue for some time in vigour, then gradually decay and go off; nor after so many conjectures which have been thrown away on this subject, does he expect that the cause of this will be known in his time.

It would seem that acts of violence sometimes will restore the vigour of the constitution. Fever, thus, and even other violent diseases, which go on in a similar manner, proceeding through their natural course, often leave the patient free, not only from the disease itself, but also from the decay arisen from some less violent disorder, that had not in itself a natural progress and termination in health. Probably, the manner in which this happens will ever remain inexplicable.

Having thus gone generally through the history of the disease, the author proceeds to the treatment. As the disease is seldom fatal in this climate, many have wished to avoid checking its progress. Dr. Fordyce, therefore, first enquires into the practice to be pursued where medicines to check the natural period, are not applied; and afterwards, to examine into the effects of those remedies which have been employed to put a stop to, or shorten the period of the disease.

In the first case, the chief object is, the employment of proper food, such as will not disturb its progress. As to the time of exhibition, it should be such as to avoid as much as possible the paroxysms of the disease. A full meal should not be taken nearer to the paroxysm than six hours before it comes on, nor sooner than six hours after it has entirely ceased. In the beginning, and when the intermissions are imperfect, vegetable food is most proper. When, however, the intermissions



sions are become perfect, the strength of the patient must be supported by animal food ; and again food of easier digestion, towards the end, when the disease becomes again irregular. Upon the whole, the only food proper where the disease puts on the appearance of continued fever at the beginning, excepting that exacerbations do not take place in the evening, are solutions of farinaceous matter : where there are crises at the beginning, although very imperfect, farinaceous matter in substance coagulated and boiled down again until soft, should form the nourishment : if the crisis at first should be nearly perfect, the food during the first, or even second week, should be farinaceous matter and fruits ; but in the second or third week, if the crisis should become perfect, or nearly so, milk not coagulated, and animal broth may be at first added, and sometimes solid animal food of easy digestion. When the crisis becomes perfect, on the day on which the paroxysm does not take place, according to the state of the patient, food should be exhibited nearly in the same manner as in health. No solid food of any kind, and of fluids only solutions of farinaceous matter, should be allowed for eight hours before the coming on of the paroxysm. After the paroxysm is over, farinaceous matter, in a solid form, broths or milk may be made use of on the day of the paroxysm ; and finally, the stomach should be kept free from noxious matter by emetics. The action of the intestines must be kept up by the most gentle laxatives, but purging has a tendency to reproduce the disease.

If want of sleep or unrefreshing sleep should take place, not depending on any accidental cause, as improper food, or fæculent matter retained in the intestines, opium may generally be employed advantageously, whilst the intermissions are perfect. About two thirds of a grain is usually a proper dose, and the addition of a small quantity of ipecacuanha or antimony is useful. The patient should be kept in bed during the paroxysms.

As by the continuance of the disease, the strength of the system is apt to be much reduced, Dr. Fordyce  
pays



pays particular attention to this matter. His valuable observations on the subject we shall present to our readers at length.

Practitioners have imagined, he remarks, that something more might be done to recruit the strength of the body, than merely leaving it to these natural means: that medicines might produce this effect; but their ideas on the subject are very much confused, which renders it necessary to investigate the subject more particularly. The idea of strength, which first presents itself in inanimate matter, is cohesive power. Steel requires a greater force to break it than marble, therefore is considered stronger. Although the same power will bend an equal bar of gold which will not bend an equal bar of steel, yet if equal bars of these metals be fixed at one end similarly in every respect, a weight at least four times as great will be required to break the gold as will be necessary to break the steel, if hung at the other end of the bar. In this respect the gold bar is the strongest, but if the idea of strength be taken from their bending, the steel. Both these ideas of strength have been adopted by practitioners in medicine. The strength consisting in inflexibility, may be admitted in parts of the human body, such as bones, although not rigorously. A bone is said to be strong which does not break when a great power is applied to it; weak when broken by a slight one.

That strength which prevents parts from being torn asunder, has often been considered as strength in medicine, as when the gastrocnemii muscles contract suddenly, or with great force, the tendo Achillis sometimes gives way; it wants therefore sufficient cohesive power to apply the force of these muscles to the foot. In this case the muscular power of these muscles cannot be said to be diminished, because their force of contraction is sufficient to overcome the strength of the tendon; it is the tendon only that is weak. In similar cases therefore, it cannot be said that the body generally is weak.



When the whole of a contractile fibre of a muscle contracts at once, all the particles must come nearer each other in the direction in which the fibre contracts; it is impossible that particles can come nearer one another, and go to a greater distance at the same time and in the same direction; therefore every muscular fibre in contracting, must possess a power of resisting its whole force in every part, so as not to break by its own power of contraction. Supposing one half of a fibre of a muscle should contract, the other half should remain at rest, that which remains at rest must be looked upon in the same light as a tendon, and if broken through would not evince any want of muscular power, excepting, perhaps, so far as that the exertion not being in the whole muscle, the effect would be less.

The many cavities in the body of various forms destined to contain fluids or solids, may be divided into two classes, those opening externally, and those not opening externally; the gall bladder, for instance, is of the first kind; of the second, the cavity of the ventricle of the heart. There is also a third kind of bag, which is not naturally destined to contain any thing, but merely so much fluid as to moisten the surface so as to allow of motion, such as the cavity of pleura and peritonæum. The first kind, destined to receive and contain, for a certain length of time, matters thrown into them, may sometimes be filled with such a quantity as to distend them to a degree that would burst them, had the body and the bags themselves lost their life. In this case the cohesive power might be considered as too weak. This hardly ever happens in the living human body. The same may be said of those cavities of the second kind, which do not open externally. Of the cavities which naturally contain only a sufficient quantity of fluids to moisten them, there are many instances of fluids thrown in so as to burst them. The skin of the leg for instance bursts, in oedematous swelling; but this has hardly ever been attributed to weakness. It has been supposed that medicines capable  
of



of increasing the cohesive power of the fibres or membranes of the body, were capable of giving greater contractile power. Alum, oak-bark, and other astringents, increase the adhesive power of the skin of a dead animal considerably, therefore have been supposed by many to act in this way as strengthening remedies, not considering that if power of contraction depend upon cohesive power, it would be absurd to apply the small doses of those medicines usually exhibited. What tanner would attempt to tan a hundred weight of leather with a drachm of oak bark?—Muscular strength does not therefore depend on cohesive power.

Elasticity is the property by which the particles of an inanimate solid come nearer to, or recede from one another.—If a steel rod be bent, the particles on the inside of the curvature will be brought nearer to one another, while the particles on the outside of the curvature will be carried to a greater distance, but without loss of continuity, for as soon as the bending power is removed, the particles that were brought nearer will force themselves to a greater distance, and those which were on the outside of the curvature will approach each other, and not only so as to restore the bar to its original state, but likewise to give it a bend on the opposite side, and so it will continue to vibrate for some time.—If a rod of elastic substance, such as steel or catgut, be fixed perpendicularly at the upper end, and a weight be hung at the lower end, the rod will be drawn out to a greater length, but at the same time become smaller in diameter. Upon removing the weight it will return to the original length and diameter, and vibrations will take place in it, which may be considered as similar to those which arise on removing the bending power from the bent rod.

If a force be applied to both the ends of a cylindrical rod of steel, so as to press them towards one another, the rod will be shortened and rendered of a larger diameter; on removing the power, the rod will return to its former length and diameter; similar vibrations tak-



king place until it settles at its proper length.—If a steel ring be pressed forward upon a cone, whose diameters increase slowly, the diameter of the ring will become greater, but on withdrawing the cone, vibrations will take place in the ring, until it settles at its original diameter and thickness.—If a rod of a perfectly unelastic substance be fixed at one end, and the other be drawn in the direction of its length, it will break without having been lengthened in the least. An elastic rod thus drawn out will allow itself to be lengthened to a certain degree, but will afterwards be broke.

If a dead muscular fibre be fixed at one end, and a weight be suspended at the other, it will be drawn out to a greater length; the weight being removed, it will return to its original length.—In the same manner, if a dead muscular fibre be pressed together by a power applied at the ends, it will be rendered shorter and thicker; on removing the power it will return to its former length and size.—If a dead muscular fibre be bent into a ring, and any power be applied to distend it, its diameter will be increased, but when the power is removed, it will return to its former state.—So if power be applied to lessen the diameter of a dead muscular ring, it will contract; but on removing the power, will immediately increase to its former size, and vibrations would take place were nothing to act but elasticity.

The moving fibres of the body are therefore endowed with an elastic power, by which, on being either extended or contracted beyond their natural state, they will be restored as soon as the power is removed, by which they are distended or contracted.

Whether the muscular fibres in the living body are prolonged beyond what their elasticity would allow, or shortened more, is a question only to be decided by experiment.—If an animal be suddenly killed by a cause not affecting the elasticity, it will be found on laying bare any muscle, and dissecting it out, that the muscular fibre will extend on replacing it, far beyond the length from its origin to its insertion; its elastic power,

a power



a power independent of life, remaining the same, the power of life only being destroyed. From this it will appear, that it had been contracted by some other power, while the animal was alive, more than it would have contracted by its elasticity; therefore that there is a power constantly contracting the muscular fibres of a living animal to a shorter length than they would be contracted by their elasticity.

After the life is entirely gone out of an animal which had been killed in the same sudden manner, the blood vessels, which are perfectly cylindrical, and perfectly full, are immediately enlarged, so as to be capable of holding a much larger quantity of blood. There is not blood enough nearly to fill the ventricles of the heart; there is so little blood in the arteries, in proportion to their cavities, that the ancients supposed they contained air only. The capillaries are not nearly full of blood, which appears from the paleness of the different parts of the body; they become florid, if an injection be thrown into them of no deeper hue than the blood. The veins, instead of being cylindrical, are flat, and not half full of blood. It cannot be denied that the elasticity remains the same in such a death. It is therefore constantly tending to enlarge the vessels, and prolong every moving fibre, but is overcome by a superior power, which exists in consequence of the life of the part.

It has been shewn therefore, that the fibres of the body, and the parts capable of producing any action, are not governed by the adhesive power of their particles, nor by their elasticity, as they are always contracted in one direction, more than they would be by their elasticity. This other contractile power has generally been called muscular action.—Muscular action seems to be exerted when the animal is at perfect rest. A contraction takes place continually in the moving part, which is greater than the elasticity of the part, and is constantly counteracted by it. When the tone of a part is spoken of, this is to be understood.

There is an instance of this constant action counteracted by the elasticity of the part itself in bivalve shell fish: there is in a cockle an elastic ligament on the outside of the shell, which endeavours to open it, and muscles which counteract the elasticity of this ligament, which, when they exert their force, overcome the elastic power of the ligament, and shut the shells: when these are not forced into action by the animal's dread of an enemy, the elastic ligament opens the shells to a certain degree, but not nearly so much as if the muscles were cut through, and the ligament left entirely to its own elasticity. The muscles therefore, when the animal is at rest, are still contracted, so as in a certain degree to overcome the elasticity of the ligament; and and this contraction is the tone of the muscles.

It is the same where the elasticity of the muscular fibres themselves counteract the tone. The urinary bladder, for instance, which in a body recently and suddenly killed by any means, which destroys the life in all the parts, such as a blow on the stomach, would allow a quart of urine to be contained in it without overcoming its cohesive power, or bursting it, or without its resistance by its elasticity; while the animal is alive, sometimes, will not allow itself to be distended, so as to contain a pint without being stimulated to evacuation, sometimes not half a pint. It will at the same time allow itself to be distended to a less degree, without any stimulus at all. This resistance in the urinary bladder to be distended above a certain degree in a living animal cannot be from the cohesion of its particles, for it may be distended twice, thrice as much, or more, without bursting: nor can it be from its elasticity, for the elasticity remains the same after its death, and yet it will then allow itself to be distended to a greater degree without any resistance; nor can it be from its muscular exertion, for when the muscles contract, they evacuate its contents. It might be suggested indeed, that it was not the muscular fibres of the bladder itself that evacuate its contents, but the pressure of the muscles of the



the abdomen upon the bladder; but every man from his feelings will perceive, that although the pressure of the muscular fibres of the abdomen do indeed assist in evacuating the bladder when much distended, yet very often the evacuation is evidently made without any exertion of the abdominal muscles. This is further proved by cases where the muscular fibres of the bladder become paralytic, in which case the urine is not evacuated, although the muscles of the abdomen have their full power.

It is evident, therefore, that the extent which the urinary bladder will allow itself to be distended does not depend upon the cohesive powers of its fibres, nor upon their elasticity, nor upon the muscular exertions when stimulated to contract, but to a disposition in the muscular fibres to allow themselves to be distended to a certain degree and no farther, without being stimulated to contraction. This disposition is their tone.

In the stomach likewise a contraction takes place, which will allow it only to be distended to a certain degree: when empty it will readily admit a certain quantity of food, but if it be attempted to throw in a greater quantity, it will resist the reception of the surplus; pain, uneasiness, and nausea will be produced, although the stomach is not distended nearly so much as its cohesive power or elasticity would allow.

The other power exerted is a still farther contraction of the moving fibres, which shortens them much beyond their tone, and is called the action of a part, as when the stomach contracts upon the food in digestion, and forces it through the pylorus, or when any muscle moving an extremity contracts, so as to produce that motion. This contraction does not remain constantly the same for any length of time, for first it is evidently alternate, as in the action of the auricle of the heart, which no sooner contracts but it relaxes again, and so of the muscles of respiration, the peristaltic motion of the intestines, where the alteration is very evident. In the muscles extending, or otherwise  
moving

moving an extremity, the alternate action is not so apparent ; but there it may be rendered visible, by magnifying it, by placing for example, a long flexible rod in the hand of a strong man ; if he extends his arm, the motion of the end of the rod will evidently shew that the muscles of the arm are making alternate contractions and relaxations.

There are therefore two muscular powers, one keeps the muscular fibres when at rest, contracted to a degree beyond their elasticity; the other produces a still greater contraction, which is only temporary.

The tone of a part is not always the same. The stomach of the same person, for instance, will at times allow itself to be greatly distended without making resistance ; at others it will resist, if a small quantity of food or drink be thrown into it.

It does not follow because a part is strong, that the tone is such as to allow of only a small distension. There is a certain degree of tone which is the natural and proper one for a moving fibre. When the stomach is weak, it will frequently only admit a small quantity of food, without being stimulated by the distension ; when strong, it will admit frequently a great quantity of food without making much resistance.

Where a moving part consists of many moving fibres, and in one of these fibres there is a proper tone ; another fibre is contracted beyond its ordinary tone, another at the same time too is distended by its elasticity beyond it ; that part can never be said to be strong, because if brought into action, that fibre only will produce the proper effect, which is of the ordinary length, according to its natural tone.

The frequent attacks of a regular tertian, the author conceives to weaken the tone in both ways. After a tertian has continued some weeks, the stomach and intestines, instead of possessing an uniform tone, are contracted in some places, in others relaxed to a greater degree, so that spasmodic contraction takes place in some parts, flatulency in others. The muscles in the extremities



ties become flabby. The action of all the parts therefore becomes less powerful and regular than in health. To remedy this a class of medicines have been employed, during the progress of the disease, with a view to restore and keep up the tone. All the bitter medicines and iron the author supposes to have this effect, but how they should have this effect, is not known. Exercise too is of importance in preserving and recruiting the strength. On this head, the author offers many excellent observations.

The author next proceeds to the second head of treatment, viz. the exhibition of remedies, for shortening, or removing the disease altogether. There could not, he observes, be a moment's hesitation in determining to restore the patient to perfect health at once, were there any remedy or mode of treatment that would certainly prevent the returns of the paroxysms of a tertian intermittent, and take off the symptoms remaining after the crisis, so that no other disease should follow. But there most undoubtedly is no medicine uniformly efficacious, or that always leaves the patient in tolerable health, and secure of not being destroyed by the remains of the disease, or by any other disorder arising in consequence of it.

Were there any such, why should different practitioners attach themselves to particular varieties of bark; recommending the brown, the yellow, or the red, with such decided preference? Why should they prefer arsenic or zinc, if any one were uniformly successful? It would not be an object for men of experience, physicians who have practised in every case of the disease, to recommend one or the other variety, nor any other remedy employed for the cure of regular tertians. In many cases of perfectly regular tertians the most skilful practitioners have been baffled in the use of Peruvian bark, and every other medicine recommended as useful in the disease. Hence the necessity of laying down a mode of treatment to be pursued, supposing the disease to go through its natural course, which the author has done.

There

There can be no doubt but that the paroxysms of regular tertians are repetitions of the paroxysm of simple fever. The symptoms are in all respects exactly the same, excepting that in a simple fever all the appearances of the disease are carried off by the crisis. At the beginning of a tertian the symptoms are never entirely carried off by the first crisis, excepting when the patient had been before afflicted with the disease. In the middle of the disease, when perfectly regular, there is no difference whatever between them, excepting there being only one paroxysm in a simple fever; in a tertian a number of paroxysms. Towards the end of a tertian the paroxysms are less severe with more imperfect intermissions.

As the only apparent reason for the return of the paroxysms in a tertian seems to be, that the first crisis is imperfect; and as it appears, that when the intermissions become perfect, the disease is continued from the power of habit; upon these grounds attempts may be made to carry off the disease, without suffering it to go through its regular course.

Any medicine that would produce the same circumstances which happen when a perfect crisis takes place naturally, by rendering the crisis complete, may occasion the fever to be entirely carried off and not to recur. Emetics occasion similar appearances in a greater or lesser degree. An emetic, therefore, given during the paroxysm of a tertian, acting along with the tertian itself, may produce a more perfect crisis, sometimes such an one as to be quite complete, and the fever may not return; this actually has happened in many cases. The preparations of antimony and ipecacuanha are preferable to the other emetics for this purpose.

When a perfect crisis is not produced, continuing these medicines during the intermission produces beneficial effects, by taking off what remains of the paroxysm during the intermission; and also by diminishing the force of the next paroxysm they tend to lessen the power of habit in producing subsequent ones. They should be exhibited



exhibited so as not to occasion sickness, and may be repeated every four, five, or six hours. When exhibited every six hours during the whole periods, they also often carry off the disease, the paroxysms after six or eight days not returning. This practice is also advantageous, as by procuring more perfect intermissions food of greater nourishment may be allowed, medicines increasing the tone of the parts may be employed more freely, and more exercise may be used, so that these remedies may act with greater advantage.

On the cinchona, as a remedy in intermittents, the author observes, that it is an interesting subject of enquiry, by what operation, or in what manner, it prevents their return? To determine this question, he has exhibited it to a man in health, to the quantity of an ounce in twenty-four hours, which is sufficient in many instances to prevent the return of a regular tertian, without any apparent difference taking place in the system. The blood on trial has consisted of the same parts and possessed the same properties as it did before the cinchona was exhibited; the secretions that could be examined have remained the same, and in the same quantity; the person has perceived no difference in any part of the system, has had the same appetite, the same sensations and powers of action. This medicine therefore produces no apparent effect in a man in health.

A much larger quantity of cinchona has been frequently employed in topical diseases, such as gonorrhœa, where the general system has not been affected. The quantity even of two ounces in twenty-four hours, for a fortnight together, has been exhibited, without producing any difference in the chemical or mechanical properties of the matter of the body, or without producing any apparent effect, excepting relief in the topical disease. Therefore nothing tending to elucidate the effect of the cinchona, in preventing the return of the paroxysm of fever, is to be found in administering it to persons in health, or affected with topical diseases.

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Since the powers of cinchona have been discovered, other substances have been employed for the same purpose, such as the medicines already enumerated, which have the same kind of bitter taste, and are employed for restoring the tone; also preparations of iron, which have been supposed to have similar powers, likewise zinc, arsenic, &c. Bitter medicines produce no effect when administered to a man in perfect health, and where the tone is already sufficient, unless they have a mixture of some other medicated matter, such as chamomile, which contains a stimulating essential oil, and orange peel, which contains an astringent matter. Nor is any effect produced from the chamomile, if the essential oil be distilled away from it.

The return of the paroxysms of fevers have been sometimes prevented by these bitter medicines, although with much less certainty, or in other words, much less frequently than by the cinchona. The author has actually prevented the return of the paroxysm of a tertian, by exhibiting chamomile, wormwood, and gentian, to the quantity of two ounces, during the intermission, but they have much more frequently failed in their effect, that is, perhaps forty-nine times out of fifty, besides that their essential oils have considerably disordered the system. Preparations of iron, &c. appear to be somewhat more efficacious.

Preparations of zinc have in some degree the same power, and if exhibited in a quantity sufficient to prevent the return of the paroxysm, they have no effect in health, but their effects are not so well ascertained as those of bitters and of iron. Preparations of arsenic and copper have also the power of preventing the return of the paroxysm of fever, but given in the same dose to a man in perfect health, produce great affection of the system; viz. violent pains in the extremities, and sometimes such affection of the stomach as to be fatal.

Thus it appears, that the cinchona is not the only substance which has the effect of preventing the return of the paroxysm, and that it has an action common to  
many



many other substances, but what that is cannot be known. It appears also from experiment, that the cinchona, and probably, the author remarks, all the medicines that act in a similar manner, have no power of taking off a fever when present, but only a power of preventing the return; or if they have any action on a fever when present, they tend to prolong it, and prevent a perfect crisis from taking place.

There can be no doubt, the author thinks, that the operation of bark is on the stomach; and from observing that a drachm of the powder given every hour for sixteen hours at the beginning of the intermission in a quartan fever will prevent the return of the paroxysm, he thinks it evident, that the impresson made by it on the stomach lasts at least forty-two hours. He concludes from many observations, that if the cinchona be exhibited in such a manner as not to prevent the return of the paroxysms in the course of a few intermissions, that its effect is generally lost, and that it never can be exhibited afterwards in any dose, or in any manner so as to produce its effect in the manner it would have done if employed in a proper dose and mode from the first. Frequently its power of preventing the return of the paroxysm is totally lost, and therefore it is of the utmost importance to use it at the beginning in such preparations and quantities as to be effectual.

When the intermissions are imperfect, the bark often fails in putting a stop to the disease. The best form of exhibiting this remedy is in powder, a drachm of which should be given every two hours at least during the intermission. This exhibition of the cinchona should not be interrupted, therefore, if the patient falls asleep, he should be awakened at the proper time for taking it. Should no appearance of the disease arise, it is to be omitted during the time that the next paroxysm would have taken up.

When slight symptoms of the attack of fever, such as languor, pain in small of the back, pain in forehead, take place at the time the paroxysm should have recurred, subsequent



subsequent to that which was prevented by the cinchona, these symptoms increase for the three or four times that would have been the times of the paroxysms, and at length a complete paroxysm recurs, and the disease proceeds as if it had never been prevented.—Several means have been employed to prevent the re-production of the disease. The first and most efficacious is, to continue the use of the cinchona, by employing it in the same dose as at first, at the time that would have been the time of the intermission after the paroxysm that was prevented by it, employing it as frequently as during the time of the first intermission. It should be discontinued at the time when the subsequent paroxysm should have recurred: and the same practice should be repeated during the time of the next intermission. That is, if the tertian had commenced at twelve at noon on Sunday, and had compleated its stages by midnight, a drachm of the cinchona should be exhibited at one on Monday morning, and continued every two hours till eleven on Tuesday morning; it is then to be omitted till one o'clock on Wednesday morning, when it is to be given in like manner till eleven o'clock on Thursday morning; it is then to be omitted till one o'clock on Friday morning; it is then to be exhibited till eleven on Saturday, and afterwards discontinued altogether for a time.

Another means of preventing the returns of the paroxysms, is by producing a profuse sweat at the time that the paroxysm should take place; and the exhibition of some very stimulating purgative which affects the whole system, as scammony, colocinthida, aloes, or jalap, given about ten hours before the use of the sudorific remedy, renders it more efficacious.

Of other remedies, Dr. Fordyce observes, that musk, opium, empyreumatic oil, æther, &c. exhibited just before or at the time of the coming on of the paroxysm, sometimes prevent it, without proving at all sudorific, but so seldom as not to be worth serious attention. Passions of the mind have sometimes prevented the return, as has also the exciting inflammation of the skin. Thus  
brace-



bracelets of mustard-seed and garlic have been applied to the wrists and ancles, which sometimes have had an effect.

These are the remedies which have been employed to prevent the return of a paroxysm of a regular tertian; that is, first producing so perfect a crisis, as that no symptoms of the first stage shall remain after it has taken place, in which case it often happens that no subsequent paroxysm takes place; secondly, employing the bark of the cinchona or other medicines, which, exhibited during the intermissions, prevent the return of the paroxysm, without having any other sensible effect on the system; thirdly, employing medicines just before the paroxysm takes place, which throw the patient into a profuse sweat, which, if it should take place just at the time of the coming on of the paroxysm prevents it from coming on at that time, and often carries off the disease; fourthly, employing anti-spasmodics at the time of the attack, or during the paroxysm, which prevent or diminish it; fifthly, exciting inflammation, which sometimes prevents the paroxysm from taking place.

Bleeding has not the least effect in preventing the paroxysm, rendering it more regular, inducing a more perfect crisis, or rendering the intermissions more perfect; it is not therefore to be employed in the simple form of the disease. Purgatives are equally useless, unless to facilitate, as before mentioned, the action of sudorifics.

We are happy to find it is the intention of the respectable author to pursue the subject, until the history of fever be completed; viz. by a third dissertation on a regular continued fever; a fourth on irregular intermittents, and the accidents which happen in them; and the last will contain the history and manner of treatment of the accidents which happen in continued fevers, and their irregularities.

ART. LII. *Generalia Medico-practica in morbos Chronicos: In usum Medicorum Neopracticorum, edidit* BERNARDUS JOSEPHUS REYLAND, M. D. &c. &c. Dusseldorf, 1795. 12mo. 61 pages, price 1s. — Imported by BOOSEY, London.

**I**N this little manual the author professes principally to have been guided by the precepts of the late celebrated STOLL. Its design is to dispose the causes of chronic diseases in certain classes, from whence this advantage would be derived in practice, that the memory of the practitioner would be assisted, and the indications of cure, and methods of fulfilling them, more easily determined.

It is divided into chapters. The first treats generally of chronic diseases.—2. Of the general causes of chronic diseases.—3. Whence the curative indications are derived.—4. What modes are to be pursued to prevent relapses.—5. Practical axioms relative to the cure of chronic affections.—And, lastly, the dietetic rules to be observed in those cases.

No new facts are held out in this little tract; at the same time we think it sufficiently well calculated to answer the purposes intended by the author.

ART. LIII. *De Sceleto Hominis Symmetrico Commentatio Anatomica: Auctore* D. FRED. HENR. LOSCHGE, *in Acad. Reg. Frederico-Alexandrina Med. et Anatom. Prof. &c.* — Erlangæ, 1795. 12mo. 142 pages. 2s. Imported by BOOSEY, London.

**T**HE wonderful symmetry and intimate correspondence of the different parts of the human body are too obvious to escape the observation of the most inattentive spectator; and the further we prosecute our enquiries, the more reason shall we find to admire the order and regularity displayed, both in the structure and actions of the animal machine. The present work points



points out only the symmetry observable in the human skeleton ; a subject into which it is unnecessary for us to enter more particularly.

ART. LIV. *The History of Medicine, so far as it relates to the Profession of the Apothecary, from the earliest Accounts to the present Period : The Origin of Druggists, their gradual Encroachment on compound Pharmacy, and the Evils to which the Public are from thence exposed ; as also from the unskilful Practice of ignorant Medicasters, and the Means which have lately been devised to remedy these growing Abuses. Published at the Request of the Committee of the General Pharmaceutic Association of Great Britain. By J.M. GOOD, Surgeon. — 12mo. 255 pages, price 2s. 6d. — DILLY, London, 1795.*

THIS publication is divided into four sections. The author's aim is, as he expresses it, in each of them, to avoid as much as possible, the two extremes of tedious prolixity, and dry uninteresting brevity ; to be explicit without becoming diffuse, and concise without offering a mere table of chronological events ; to state his facts and arguments fairly ; and engage the reader's attention, by rendering the subject, at once, both interesting and pleasant.

The first section treats of medicine, so far as it relates to the apothecary, among the Greeks, Romans, Arabians, the earlier ages of France, Italy, and Germany. The immediate occupation of the apothecary, during these different æras, and the rank he obtained among the different branches of the medical profession. The existence of any such occupation as that of the modern druggist investigated and denied, and the quarter pointed out from whence the apothecary was supplied with the drugs he stood in need of.

Sect. II. Of the origin of medicine, and more especially of the profession of the apothecary in Great

Britain. The different charters and acts of parliament which have successively been obtained relative to medicine; the knavery and ignorance of multitudes of medical practitioners, from the universal incompetency of those public edicts to prevent abuses. The origin of the occupation of the druggist; and the source from whence the apothecary derived the stock of drugs anterior to this period.

Sect. III. Of the necessity of the profession of the apothecary to the nation at large; and the evils to which both are, at present, equally exposed. The origin of the general pharmaceutic association to investigate these evils; its extensive correspondence with practitioners in all parts of the kingdom; and a brief account of its ultimate design, and of what it has already achieved.

Sect. IV. Observations on the principles of action laid down by the pharmaceutic association; and a vindication of them, as consistent with general justice and policy; as equally and indivisibly connected with the advantage of the nation at large, and the very existence of the profession itself, as a profession of any possible utility.

The subject is certainly in great measure new, and to the majority of practitioners interesting. Several histories of medicine, and of physicians, have been published in most European countries, but none that has any particular reference to the pharmaceutic branch, or that which regards the apothecary. The work, we have little doubt, will come into the hands of most of our readers. For this reason, and as not taking part in the controversy, we deem it unnecessary to enter into detail. The subject is already before the legislature, where it will doubtless meet with justice.



ART. LV. *Dialogues between a Pupil of the late John Hunter and Jesse Foot; including Passages in Darwin's Zoonomia.* — 8vo. 102 pages, price 3s. — BECKETT, London. 1795.

MR. Foot may be right in conceiving it impossible for any man to support an argument, abstracted from some degree of passion: he may be right in supposing that irony and humour are the most eligible instruments which reason has to work withal, when truth is to make its way against vulgar conviction. But Mr. Foot's pamphlet has taught us to discriminate between low scurrility and unqualified abuse, and genuine irony and humour. The former, we trust, will always meet with that contempt which, from liberal minds, it justly merits.

In point of fact, or argument, the pamphlet before us contains nothing that would lead us to be particular. Its general style may be known, by the following quotation; for which, however, we deem it almost necessary to apologize to our readers. Mr. Foot is much hurt that the Critical Reviewers should have omitted all notice of his *Life of John Hunter*; and the pupil is made to remark as follows:

‘ PUPIL. I feel the force of your observation; and I suppose, that will be the plea given by the Critical Reviewers for having been silent altogether upon your *Life of John Hunter*, for not having even noticed it,

‘ FOOT. The Critical Reviewers might or might not suppose I meant an attack upon them, when I said the Hunters hired their Review as a vehicle of their complaints, and retained its editor by a bribe; but that was no fault of mine, it belongs to the natural history of your preceptor, unless I have advanced a falsehood, by referring my readers to the Critical Review, and by their finding nothing in it to prove the question; but if what I said in the *Life* be true, if they have thus embarked in this desperate and mercenary project, the fault is with those who, pretending to be independent, and



to impart purely the knowledge of others, and their own observations upon it, are detected in venally disseminating dissensions and propagating false opinions, with those who have put themselves in the way of being exposed, when the truth of the case accidentally comes out, and is again accidentally revived to the public eye.

• PUPIL. Besides, sir, I presume that the present authors of that Review were not the authors during the contests, those being thirty years ago; and that therefore the present could not consider themselves in any manner principals in transactions too remote for their time; at least it would have been politic in the present, and it would have shewn that they were, what Reviewers ought ever to have been, masters of the passions, if they had not given such strong cause for suspecting that they mingled their feelings with those of their predecessors: surely, sir, you cannot suppose that they are at this present time the same set of people?

• FOOT. Not the individual set, but the same race; not individually the same mind in the same body, the same lodging in the same house, the same coat upon the same back; fate and fashion have rendered that impossible; but they are of the same class with the former, impelled and continued on by the same necessities; they receive the same pay, feed on similar food, lie in similar chambers, are endowed with similar talents, partake of similar educations, trained up to similar practices, possess similar countenances, and unblushingly hold out similar palms of corruption.

• PUPIL. Then you think that they have looked out for a bribe from you, to defend their own reputation; and not having received one, they suffered it to take its chance?

• FOOT. Mark me, sir, I do not think for them, or care about them. The author of *Tristram Shandy* and of the *Crazy Tales* have exchanged with them a few lessons in their own way; they knew very well how to adapt themselves to every condition; they ascertained with much more nicety than I can, the exact depravity of



of the human heart ; I would rather refer you for their characters to them, than take up our present time farther about them ; they are just worth our notice, and that is all ; in spite of us they will always be incorrigibly the same to the end of time, the lowest among men, drudging on from necessity. Have you not lately seen in your way to Greenwich, asses with sand-bags upon their backs ?

‘ PUPIL. I have.

‘ FOOT. And so did I thirty years ago. Now these which you saw, lately probably were not the same individual asses which I then saw, or which might have been seen by Sterne, or by Hall, or by any other passenger from London to Greenwich, that was their cotemporary ; but still asses are destined to carry the bags of sand from Greenwich to London.

‘ PUPIL. How long do you reckon an ass might live ?

‘ FOOT. Ask that of a Reviewer.

‘ PUPIL. The series of your Life of my preceptor has been said to be a libel upon him, as attacking his education, his candour, his veracity, his honour, his surgical talents, and his general deportment.

‘ FOOT. I never expected to write the Life of John Hunter without being stung by hornets ; I was prepared for that in my own mind before I began ; I did it with open eyes and mental conviction ; but the only question is, whether what I have advanced be true or not ?’

ART. LVI. *A Description of the Jail Distemper, as it appeared among the Spanish Prisoners at Winchester, in the Year 1780 ; with an Account of the Means employed for curing that Fever, and for destroying the Contagion which gave rise to it.* By JAMES CARMICHAEL SMYTH, M. D. &c. 8vo. 247 pages, price 4s. — JOHNSON, London. 1795.

THE disease which is the subject of this dissertation, prevailed, during the spring and summer of the year 1780, amongst the Spanish prisoners confined

in the King's house at Winchester; and owing to the great mortality it occasioned, and the still greater alarm it excited in the neighbourhood, having become the subject of parliamentary inquiry, the house of commons appointed a committee to examine into the business. From their report it appeared, that the disease in question had been brought by the Spaniards from on board their ships, that the commissioners of sick and wounded seamen, to whose care every thing respecting prisoners of war is immediately committed, had been extremely attentive to their duty, and had employed every means in their power to check the progress of the contagion, though without effect. Towards the end of May, they, by the advice of the late Dr. Fothergill, applied to the author, requesting him to undertake the cure of a disease whose violence and fatal effects were increasing every day. His success in the undertaking, he says, was equal to his wishes; for in a fortnight's time he had the satisfaction to see the contagion almost completely destroyed, the number of sick greatly reduced, and those who remained in the hospital, for the most part, in a state of convalescence.

After remarking that the observation of Sydenham, that epidemical distempers are in general more violent upon their first appearance, and become milder from their continuance, did not apply to this disease, the author gives the following general description of it:

‘ This disease generally attacked suddenly, and the stomach was always the part first affected; a very disagreeable feeling and sinking at the præcordia, or at what is called the pit of the stomach; a degree of nausea and giddiness were the first symptoms, which were soon accompanied with a pain immediately above the eyes and at the temples, or a dull pain at the back part of the head. The sick complained also in the beginning of coldness and chilliness, seldom of thirst, always of great weakness and debility, had a tremor upon them, sighed frequently, and when asked any questions about their complaints, universally put their hand to the region of  
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the stomach, expressing in the strongest manner, that there was the chief seat of their uneasiness and sufferings; their countenance was commonly pale and dejected, and their eyes looked dull and heavy, though the tunica albuginea of the eye was of a clear white; their tongue was moist, and covered with a cream-coloured slough or mucus: they were in general costive, with the abdomen tense and hard; the pulse was for the most part small and fluttering, in some few instances it was but little altered from a natural state, although the danger was not less on that account. The sick seemed always drowsy, and commonly remained in a state of dozing or slumbering during the whole course of the disease; but when spoke to they awoke readily, and when quite awake gave distinct answers to any questions put to them. Few were permanently delirious or comatose, unless for some short time before their death, and many, as I was informed by the Spanish clergyman who attended them, were sensible to the very last.

Mr. Kentish, surgeon to the hospital, informed me, that upon the first appearance of the distemper, or soon after the arrival of the Spaniards, he had, in some few instances, observed swelling of the parotid glands and petechial or purple spots on the skin; but certainly, during the whole of my stay at Winchester, neither discolourations of the skin, miliary eruptions, hemorrhages, parotids, nor buboes, could be justly enumerated among the symptoms of the disease. Many of the sick complained of a sore throat, or of pain and uneasiness in swallowing; some were seized with a difficulty in breathing and other pneumonic symptoms; one man had an abscess in the liver; but in the greater number of those who died, excepting the uneasy sensation at the region of the stomach, there was no appearance of local inflammation or of local disease: so deceitful indeed, was this distemper, that several, who (judging by their pulse or even countenance) had but a slight appearance of indisposition, died in twenty-four



or indeed in twelve hours after their reception into the hospital. The blood taken away in this fever was (as I was told) of a loose texture and cohesion, though the smell of the sick or of their evacuations had nothing in them remarkably offensive or putrid. From observing this circumstance, and that petechiæ, vibices, or hæmorrhages, rarely occurred; that the sick, in general, retained their senses, were able to raise themselves in bed, and to assist themselves with what they wanted; I could not at first allow myself to think that the disease was of so malignant a nature, or that the danger was so great as had been represented to me; but I was soon convinced of my error, by seeing the numbers that perished daily with all those flattering appearances.

‘It has been frequently remarked, that in malignant fevers, the danger cannot be estimated by the state of the pulse, or from the ordinary symptoms of the disease; but there never was a more striking illustration of the truth of this fact than the present instance afforded; all that could be known was, that a person seized with this fever ran the greatest risk of his life, be the symptoms ever so favourable: even those who escaped from the more immediate danger of the disease, recovered in general very slowly, were a long time weak and subject to returns of fever, or they fell into chronic disorders which in the end proved no less fatal. Those who suffered a relapse commonly died; there was scarcely, I believe, an instance of a person being a second time dismissed from the hospital.’

The author next gives an interesting account of himself, who was twice attacked with the disease.

The circumstances which he deemed peculiar to this fever, were, the very disagreeable feeling and sinking at the præcordia; few being permanently delirious or comatose, unless for a short time before death; the sick seeming always drowsy, and commonly remaining in a dozing state; the dullness and heaviness of the eyes, although the tunica albuginea was of a clear white; the tongue being moist, and covered with a cream-coloured  
 flough;



flough : the non-appearance, in the greater number, of local inflammation, or of local disease.

The causes which appeared to give rise to the great mortality of this disease were, the crowded state of the prison, want of cleanliness, close confinement, and depression of spirits. A proof of the operation of the last mentioned cause was, that many of the prisoners belonged to the Caracca company, and had private adventures on board : these men, when captured, having lost their all, were particularly low-spirited ; and it was remarked, that they were the first who were seized with the distemper, and most of them died.

In the next place, the author proceeds to inquire into the nature of the contagion, which gives rise to jail and hospital fevers. That this is of a putrid nature, he thinks is proved by the following observations. ‘ We remarked, in the beginning, that this disease is constantly produced where a number of people are shut up together in a close place, without the greatest attention to cleanliness, and a renewal of the air. We know, that all the excretions of the human body have made a certain advance or progress towards putridity, and that, placed in circumstances favourable to putrefaction, they soon become highly putrid. We are certain, that of all the human excretions, none is more highly animalised, or so susceptible of becoming putrid, as the perspiration or vapour issuing from the surface of the body and lungs. We know also that the perspiration even of vegetables, confined under similar circumstances, becomes putrid, and in a high degree noxious to man : *à fortiori*, then, we may conclude, that animal perspiration undergoes a similar alteration, and will prove still more noxious.

‘ We find also, that the contagion, resulting from animal perspiration, shews its baneful effects more quickly, and more forcibly, in proportion to its quantity, and to its being placed in circumstances the most favourable to putrefaction ; consequently, in proportion to the size and closeness of the place, the temperature



ture and the moisture of the air, and the additional or accessory putrid matters with which it is combined.

‘ We find likewise, that the formation of this contagion is prevented by causes that renew the air, and carry off the perspiration, or prevent its tendency to putrefaction. We observe also, what may be considered as an analogical proof, that a contagious vapour, differing only in degree of virulence from the human miasmata, is constantly produced from water alone, and still more from water mixed with vegetable and animal matters, when exposed in sufficient quantity and under circumstances favourable to putridity ; but the septic nature of the jail contagion will be farther illustrated, by what we have to notice of its effects on the human body, and of the methods of destroying it, or of rendering it harmless.’

‘ The contagion then, he observes, of the jail or hospital fever, may justly be considered as one of the most subtil and powerful vapours of the putrid kind ; and, consequently, its immediate and destructive effects upon the body are not to be wondered at. In ordinary cases of fever, the vital principle is roused into action, and Nature is commonly sufficient of herself to remove the morbid cause ; but here, as in the real pestilence, the contagion introduced into the body, seems to act as a narcotic poison upon the heart and nervous system, suppressing the principle of life, instead of rousing it to the conflict. In this distemper, therefore, where nature can do so little, and even art, unless immediately called to her assistance, is equally unavailing, it is of the utmost consequence for us to know whether the contagion cannot be prevented or destroyed.’

The treatment of the prisoners, and means employed to purify the prison and hospital wards, Dr. Smyth thus describes:—‘ Upon my arrival at Winchester, the first object that seemed to claim my attention, was the enlargement of the hospital ; which I found could easily be accomplished, as there were several empty wards adjoining, that might, in a few days, be fitted up for the reception



reception of the sick. I therefore gave orders that this should be immediately done; at the same time, to insure the free admission of air, so necessary for their recovery, I directed that the casements of most of the windows should be removed, and the windows lever-boarded; that the chimneys in the different wards should be contracted into narrow flues, and a fire kept constantly in each; and that, close to the ceiling, circular openings should be made in the walls separating the different apartments, which would allow an uninterrupted circulation of air through the whole, now capacious enough, with the proposed addition, to contain three hundred men. But whilst I was engaged in this most necessary work, my attention was called off, by information I received of the sick list increasing so rapidly, that unless some check was given to the contagion, the addition made to the hospital, and twice as much, would soon be insufficient for the accommodation of those who were daily seized with the distemper. I now perceived, that I had begun at the wrong end of the business; that it was necessary to give my first attention to the prisoners, and although I might not immediately succeed in destroying the contagion, I must at least endeavour to lessen the violence of it; that, this being done, I should have room enough for the sick, and sufficient leisure to attend to them. I therefore, after again examining with attention the prisoners and prison wards, adopted the following plan.

I divided the whole of the prison wards into four parts; and, lodging the prisoners, which could easily be done, in three of those parts, I set aside the fourth for the purpose of purification, which was conducted as follows:—After removing all the hammocks, bedding, &c. from the wards, they were first thoroughly cleaned out; the hammock posts were well washed with diluted marine acid, and the same thrown, by means of garden watering machines, to the upper parts of the posts, as high as the ceiling. The wards, when dry, were closely shut up, and pots placed in them, at different distances,



distances, containing from half a pound to a pound of nitre, which was deflagrated by an iron heater, put into each pot. The wards were then shut up for some hours, and, when opened, were exposed to a free ventilation. After this process had been once or twice repeated, the wards were again furnished with fresh hammocks, palliasses, and bedding, instead of the old bedding, &c. which was taken away. Having thus prepared the wards, I ordered as many of the prisoners, as could be lodged in them, to be taken to the river in companies, about one hundred at a time. They were stripped, washed, and new clothed; all their old clothes being carefully removed, they were brought back to the prison, and lodged in the prepared wards. The good effects of this plan, so far as it could be carried into execution, was immediately felt; as none of the prisoners so managed, were afterwards seized with the distemper; but, as we could not procure a sufficient quantity of fresh clothes and bedding, we were obliged to supply this defect by fumigating and purifying those which we had taken away, and delivering them again to their owners.

‘ We employed the new clothes and bedding for the second division, as we had done for the first. The third division of prisoners was treated in the same manner, and the same means were employed for purifying the different prison wards; the effects of which, in effacing the contagion, appeared directly, from the great diminution in the number of the sick. Fearing, however, that the distemper might again break out amongst them, from some latent seeds of contagion still adhering to the clothes or bedding, I desired that the prisoners should every morning be reviewed, and particularly examined respecting their health by their own surgeon; and as the Spaniards were by this time sensible of the attention paid to them, and already experienced the good effects of it, they now of themselves (what at first could not be obtained without compulsion) took out their hammocks every day to the airing ground, and when the weather would admit of it, exposed their bedding to the open air during



during the greater part of the day. I had also a shed erected for their walking under when it rained, and a ward or two set apart for their dining, and did not suffer them to enter the wards where they slept, until the evening; taking care to have these wards fumigated, and well ventilated every day.

‘ Having finished with the prison, and prisoners, I again returned to the hospital, and found the seven new wards, which I had ordered to be fitted up, ready for the reception of the sick: they were, in part, furnished with new beds; but as we had not a sufficient supply of these, we were under the necessity of using some of the old ones; those, however, I took care to have first fumigated, then washed with hot soap-suds, and afterwards diluted with marine acid. When every thing was properly prepared in these new apartments, I had such of the sick as could without danger be removed, brought into them; and, by this means, emptied some of the old hospital wards; which, with the beds and bedding, were immediately fumigated, cleaned out, and prepared in the manner already described. Proceeding in this way, we in a few days got the whole of the hospital put into a proper condition; and when any of the sick died, I ordered that the bed and bedding should always be removed, and not employed again until it underwent a fresh fumigation and cleaning. The not having attended to this necessary precaution, had certainly been destructive to many; the beds and bedding proving fatal to those who were put into them.’

The general mode of treatment which was employed, will appear from the directions which were given by the author to the hospital surgeon. ‘ When a man is brought to the hospital with the symptoms of the jail fever, he is, in the first place, to be sent to the bathing room, and bathed for ten minutes in water, at the temperature of 100 of Fahrenheit’s thermometer; all his clothes are to be removed to the fumigating house; after bathing, he is to have an hospital shirt put on, and,  
being



being wrapped up in a blanket, must be conveyed to the hospital, either in a hammock or sedan chair. When put to bed, he is to have the common glyster administered, and afterwards is to take the tartar emetic solution, unless where that medicine has been previously given by the Spanish surgeon, conformably to his instructions. Soon after the operation of the emetic, or immediately, where that has been already given, he is to take the *bolus antimon. cardiacus*,\* with four spoonfuls of one or other of the mixtures, Nor 7 or 8 ;† and these medicines are to be repeated (varying them according to the symptoms) every four or six hours. It may perhaps, in some cases of extreme weakness, or in the second stage of the disease, be adviseable to substitute the Peruvian bark, in some of the forms subjoined, instead of the above-mentioned antimonial medicine, &c. but this is left to the judgment and discretion of the surgeon. I will only suggest, that where extreme debility, or the tendency to gangrene require the bark, we are not to expect or wait for an intermission or remission of the fever. The bark, in such cases, may always be safely administered, if the tongue is not parched, nor the skin dry, when there is no difficulty of swallowing, nor the breathing much oppressed. But, under those circumstances, I think it neither safe nor useful, and would most undoubtedly prefer the medicines of the class first prescribed. Wine is proper in most stages of the disease, unless where the inflamed appearance of the eyes, with a flushed countenance, and the violence of the patient, give reason to apprehend a phrenzy, or inflammation of the brain, when wine aggravates the symptoms, and perhaps hastens the fatal termination. But, where wine is proper, it should never be left to the discretion of nurses, but administered either by the surgeon himself, or by the dispenser, who may, with very little trouble, give it to the sick in his daily rounds; distinguishing also, by this mark of attention, those men who

\* Consisting of the pulvis antimonialis and confectio aromatica.

† Julep e camphor, spt. minder. spt. vitriol. dulc. &c.



who are well-behaved and orderly, from the disobedient and refractory. Mutton broth may be indiscriminately allowed to all the sick who choose it; but the strength of it should be proportioned to the state of the patient. I would advise the having three different kinds of broth, or rather, to have broth of three different degrees of strength; the surgeon will then direct the broth most proper for each patient. Blisters, applied to the back, may possibly be of advantage, in cases of inflammatory delirium; but they should not be rashly or indiscriminately used: they should be looked upon by the surgeon more as a symptomatic, than a general remedy. In cases of violent or involuntary purging, the bark and antimonial medicines must either be entirely laid aside, or given along with *theriaca*, *philonium*, or some other opiate. It is always of advantage to keep the body open, which may easily be done, by a laxative glyster, or by a dose of the purging electuary, given by itself once in twenty-four hours, or administered, in smaller quantity, with the *antimonial bolus*, every six or eight hours. The drink of the sick should be marshmallow tea, or any other ptisanne, acidulated with the marine acid, toast and water, or lemonade, to which a few drops of the marine acid may occasionally be added. Those who dislike mutton broth, may have boiled rice for their food.'

Respecting the treatment of fevers of this description, Dr. Smyth remarks, that *putrid contagions*, after they have been admitted, and even after they have excited various morbid symptoms, may be again expelled, either completely, or at least to such a degree as greatly to lessen their virulence, and the dreadful consequences which would otherwise ensue. The means which have been employed for this purpose with success, are emetics, sweating, and blisters, the last on the single authority of Dr. Lind. But it is only in the beginning of the disease, or first stage, that this method of curing it is practicable. How far this stage extends, or what

is



is the duration of the period during which the fever may, with certainty, be removed in this summary way, is not ascertained; the author, however, imagines, that it seldom exceeds the first four and twenty hours, and that when the contagion has remained in the body beyond this time, it in general has produced morbid effects, which cannot so expeditiously be subdued.

If, by any of the means pointed out, we succeed in removing the symptoms entirely, or in bringing on a complete intermission of the fever, the return is to be prevented by a free use of bark and tonics. But when the preventive method has proved ineffectual, and the disease has advanced to the second stage, recourse must be had to other modes of treatment.

Having discussed the opinions of different authors on this head, Dr. Smyth proceeds to lay down his own. The great objects, he observes, of the rational physician, at this period of the disease, are, to moderate the symptoms of fever without diminishing the strength, and to support the strength without increasing the heat of the body or frequency of the pulse: and for answering those complicated, and seemingly opposite intentions, he knows no medicines so proper as some of the preparations of antimony, and the spiritus ætheris vitriolici, or the vitrolic æther itself. Of the spiritus ætheris vitriolici he speaks in high terms, as having an advantage over most cordials, in not increasing the heat of the body, or quickening the pulse; but, on the contrary, rendering the action of the heart more regular and slow. It is also serviceable in promoting a diaphoresis, and in lessening anxiety and tremors. He gives it commonly in the infusum rosæ, two or three drachms to the pint.

In the third, or last stage of the disease, the author recommends bark, wine, and the mineral acids. The serpentaria, contrayerva, volatile alkali, and musk, he has little opinion of. Nor does he think blisters of much utility.

• Contagious



Contagious fevers, Dr. Smyth observes, especially when they arise from a jail contagion, seldom terminate in complete recovery, and it is commonly a long time before those who have escaped the first and more immediate danger, are restored to their former health and strength; they in general remain languid, their appetite impaired, and their sleep unrefreshing; they are giddy and faint, upon attempting to walk, or even from an erect posture; their pulse continues extremely quick, sometimes even quicker than during the fever; their sight is frequently impaired, and the pupils of the eyes greatly dilated, with a puffy redness of the eye-lids, particularly in the morning; their legs are apt to swell towards night; and they have generally a preternatural heat and dryness in the palms of their hands; sometimes they become suddenly dropical or anasarcaous, and I have known instances where, with the symptoms of water in the chest, or pericardium, they have died suddenly. I have repeatedly seen persons afflicted in all the different ways I have now described, and which it is necessary for the physician to know, that he may be prepared to obviate them; for, if neglected, they will in the end prove equally fatal with the fever itself.

From the state of weakness and irritability described above, people usually recover by pursuing the methods I formerly pointed out; it may be proper however to observe, that as the head is more particularly affected in these fevers, it is sometimes very long before the patient is perfectly free from giddiness, and partial defects of sight: I have sometimes seen the pupils of the eyes remain for several weeks so considerably dilated, with a pulse from one hundred to one hundred and twenty, as to give just grounds to suspect that the brain was materially injured; and yet these symptoms at last have gradually disappeared, and the complete recovery of the patient proved that they were only the effect of temporary weakness and irritability.

When convalescents become suddenly anasarcaous, they require purging, and commonly receive immediate



ciate relief from a brisk purge, combined with squills, or some other diuretic medicine. Cream of tartar with jalap is, perhaps, one of the best purges we can employ in such a case.

‘ When there is reason to apprehend water in the chest, or pericardium, it is necessary to adopt a plan of treatment proper for the cure of this complaint. I need hardly remark, that there would be great impropriety and danger, in using fox-glove, in a case where the action of the heart is already so considerably weakened.

‘ Besides the complaints which I have now enumerated, others might be mentioned, as being sometimes brought on by contagious fevers, such as epileptic fits, asthma, diseased liver, jaundice, &c. but as they occur more rarely, and as I have nothing new to offer respecting their treatment, I shall conclude the present subject with the declaration of Sydenham.’ — “ *Sicubi circa theoriam me hallucinatum fuisse lector deprehendat, errori veniam peto; verum quod ad praxin attinet, profiteor me omnia ex vero tradidisse, nihilque uspiam proposuisse nisi quod probe exploratum habeo.*”

The utility of the nitrous acid, in destroying contagion, the author thinks proved both by reason and experiment. He has also established the safety of breathing its fumes.— ‘ From all the information, says he, I can procure, I do not find that any person has ever made use of the nitrous acid to destroy contagion but myself; for, as this acid is not produced by the deflagration of nitre, or of gunpowder, the employment of these cannot be considered as an instance to the contrary. I formerly mentioned, that I had employed the nitrous acid in two different forms; either the vapour arising from the yellow or smoking nitrous acid, which is a mixture of the acid with nitrous gas, or the more pure nitrous acid, detached from nitre, decomposed by the vitriolic acid. In one or other of those forms I have used it, both in hospitals and in private practice,

for



for sixteen or seventeen years past; and have had the satisfaction to obtain the most decisive evidence of its happy effect, in preventing the spreading, or farther communication, of contagion.

• The most highly contagious fevers that occur in our hospitals, do not affect the patients in general, lodged in the same ward, but only the nurses, or those patients who assist them, or those who lie in beds contiguous to the sick; to such persons I have frequently seen the fever communicated, and have also repeatedly prevented the farther spreading of the disease, by placing gallipots, with the fuming nitrous acid, between the beds of the sick and of those who were not yet affected by the contagion. And, in private practice, I can declare with truth, that where the nitrous acid has been constantly used as a fumigation, I have not known an instance of a contagious fever having been communicated, even to a nurse or an attendant.

• These facts will, undoubtedly, be allowed to be very strong evidence, with respect to the power of the nitrous acid to destroy contagion; still, however, they are liable to some uncertainty, and I will freely confess, that the effect of the nitrous acid for this purpose, cannot be said to be fully proved, until it has been tried in fumigating tainted clothes, &c. and until its power has been found sufficient to destroy contagion on board of ships, and in prisons and hospitals, where it exists in a much higher degree than I have had occasion to see it, excepting at Winchester.

• It will probably be asked, why I did not make a complete trial of it there? To this I answer, that with respect to fumigating infected clothes, bedding, &c. I did not think myself warranted, especially on an occasion of so much importance, to make trial of an uncertain remedy, when a certain one was in my power. As to fumigating the prison and hospital wards, it was evidently my intention to have employed the nitrous acid, but I was mistaken in the means I took to procure it,



it, and have not since had a proper opportunity of repeating the experiment.

‘ The effect of the marine acid, in a state of vapour, on contagion, I have not yet had occasion to try, but have no doubt that it would be found of sufficient efficacy for destroying it; and, from the foregoing experiments, it is evident that, though not so mild or safe as the nitrous acid, it may be used, in a moderate quantity, even where people are present. The only purpose to which I have applied it, has been, when properly diluted, to wash the hammock posts, bedsteads, and furniture; also the floors and walls of the apartments of the sick: and I am persuaded that, even in this way, it was extremely serviceable, certainly more powerful than the most concentrated vinegar.

‘ I shall now conclude this subject with a few practical rules or observations, which may be looked upon as corollaries, or inductions, from the preceding experiments.

‘ The well known efficacy of the sulphureous acid, in destroying contagion, is a sufficient reason for our continuing to use it as a fumigation for clothes, furniture, &c. The nitrous acid, being attended with no risk or inconvenience to the respiration, and appearing, from our experience, of sufficient efficacy to prevent the farther spreading of contagion, seems the proper antidote to be applied, in all situations where persons are necessarily present; and is, in short, the *desideratum* sought after by the benevolent Dr. Lind.

‘ For purifying empty hospital or prison wards, and ships, I should also prefer the nitrous acid to the sulphureous, as I believe it to be equally efficacious; its vapour is more volatile and penetrating; and it does not leave the disagreeable smell which sulphur does. But, for this particular object, I think it would be advisable to make trial also of the marine acid, and of the mixture of nitrous and marine acids, as I am convinced of the efficacy of all the mineral acids for destroying contagion; and our experience is not yet sufficient



ficient to determine their relative advantages and disadvantages.

‘ To obtain the nitrous or marine acid, in a state of vapour, the method is extremely simple. It consists in decomposing nitre, or common salt, by means of heated vitriolic acid, which may be done as follows: — Put half an ounce of vitriolic acid into a crucible, or into a glass or china cup, or deep faucer; warm this over a lamp, or in heated sand, adding to it from time to time some nitre or common salt: these vessels should be placed at twenty or thirty feet distance from each other, according to the height of the cieling, or virulence of the contagion. In hospitals, or prisons, the lamps, or vessels, containing heated sand, may be placed on the floor; on board of ships, it will be better to hang them to the cieling by waxed silk cords. The fumigating lamps, which I have seen at Moyser’s, in Greek-street, Soho, a great number of which I was told have been sold to the navy, may be employed for this purpose; although they would answer much better, if the faucer was deeper, and if, instead of a place for a lamp, there was a box proper for containing hot sand, in which the faucer might be placed.

‘ As fumigating with nitrous acid is attended with no inconvenience, and as the process is so simple, and the materials so cheap, it should, as a means of prevention, be employed for some hours every day in transports having troops on board, and in crowded hospitals; and, if there is any appearance of contagion, the fumigation should be executed with more care and attention, and the vapour confined for several hours at a time. Fumigating vessels, or lamps, should also be placed contiguous to the hammocks, or beds, of persons affected with any contagious or putrid distemper, whether fever or dysentery.

‘ By taking such precautions, a great deal of mischief would probably be prevented, and a stop put, in the beginning, to one of the most fatal calamities that ever afflicted mankind.’



We conclude our account of this essay with remarking, that it is in several respects a very valuable publication. It exhibits proofs of much attentive observation, and judicious regulation. There are, however, points which admit of dispute; such, for example, as the attempt to determine the putrid nature of contagious matter, and the idea that blisters are of service in the beginning of the disease, by affording an outlet to noxious matter.

— *sed ubi plura nitent*  
*Haud paucis offender maculis.*

ART. LVII. *An anatomical Description of the human gravid Uterus, and its Contents.* — By the late WM. HUNTER, M. D. 4to. 88 pages, price 6s. — JOHNSON, London, 1794.

THE editor of this posthumous work is Dr. Baillie, nephew of the late Dr. Hunter. The general nature of the work, and the reasons for its late publication, are given by Dr. Baillie in an advertisement. An accurate anatomical description of the human gravid uterus and its contents, he observes, has not been hitherto published. It was therefore a *desideratum* in anatomy; and no person was so capable of supplying this want as the late Dr. Hunter. He had more opportunities of examining this subject than any other anatomist; it had engaged very early his attention, and he had pursued every inquiry relating to it with uncommon ardour. The result of his labour has been, that he has improved very much the knowledge of this part of anatomy, more especially by discovering the *decidua reflexa*, and by explaining the true nature of the decidua, as formed by the uterus; which, before his time, was altogether misunderstood. About twenty years ago, he published a large volume of plates to illustrate the anatomy of the gravid uterus and its contents; which, for accuracy of representation, and excellence of engraving, have never been surpassed in any anatomical work. The first artists



tists were employed, who, while they contributed to the improvement of a most interesting part of science, were ambitious at the same time of adding to their own reputation.

No regular description of the anatomy of the gravid uterus accompanied these plates, but the plates themselves were merely explained. Dr. Hunter had intended, however, to make up their deficiency, so as to render the whole work complete. He made a promise to this purpose in the preface to his large volume of engravings; and had left behind him a manuscript, containing a description of the anatomy of the gravid uterus and its contents, which he had not quite finished. Dr. Baillie has added, what appeared to him to be deficient; but this amounts to only a few pages.

A work merely descriptive, unaccompanied with either physiological or pathological observations, it must be readily conceived, does not admit of abridgment. We are under the necessity, therefore, of simply announcing it to our readers.

ART. LVIII. SKITZZE\* EINER PRAGMATISCHEN LITERARGESCHICHTE DER MEDICIN. *A Sketch of an Authentic History of Medical Literature*; by J. D. METZGER, M. D. Physician to the King, and Professor of Medicine at Königsberg; 8vo. pp. xiv. and 448. Königsberg. 1792. Nicolovius.

THE author was induced to write this work in consequence of having formerly adopted Professor Blumenbach's *Introductio in historiam medicinæ literariæ*, as a text-book for his lectures upon this branch of medical

\* Considering it as a part of our duty to collect from every source, whatever relates to the subject of Medicine, we readily acknowledge our obligations for the following articles from the German, to a new and useful work, entitled "A Concise Review of Original German Books," published quarterly, price 1s. 6d. by Robinsons, London; and Mudie, Edinburgh.



dical study. For the improvement of his pupils he has consulted the more complete medical writers, enquired into the sources from which they derived their information, and thus collected materials for laying down such a number of facts relative to every progressive improvement as he deemed necessary for giving the student a sufficiently clear idea of the state of medicine in every period of time, into which he has divided the present history. In the introduction Dr. Metzger explains what the history of medical literature properly implies. "It is not (says he) a dry narrative of medical practice, a shallow knowledge of old writings, of former hypotheses and antiquated follies—not a description of the private life of physicians, their marriages and number of children; nor a mere enumeration of their works: but it is the light of truth and the doctrine of life—a philosophical view of the origin of medical science and its various systematical arrangements—the study of the spirit which characterised every epoch; of the collective knowledge which was acquired; of the contributions which were made towards its improvement by every respectable medical character, and of the influence of philosophy on the science of medicine in each period."—Although the author has preserved some parts of the plan and order followed by Professor Blumenbach, in his *Introductio*, yet he treats the subjects in a very different manner, by dividing the history of medicine into thirteen distinct periods. Consistently with our plan we can give only the general heads of this division. Period 1, from the origin of medical science to Hippocrates; p. 2, from Hippocrates to Asclepiades; p. 3, from Asclepiades to Galen; p. 4, from Galen to the Arabians; p. 5, from the Arabians to the Arabists, or the oriental system of medicine; p. 6, from the Arabists to the beginning of the 15th century, or the occidental system of medicine; p. 7, the history of medicine during the 15th century; p. 8, the first half of the 16th century, in which the system of Galen was overturned; p. 9, the second half of the 16th century; p. 10, the first half of the 17th century,



century, a period in which the circulation of the blood was discovered by the immortal William Harvey; p. 11, the second half of the 17th century, in which the experiments with the transfusion of blood excited much attention; p. 12, the first half of the 18th century, which the author entitles "the mechanical or organical system of medicine;" p. 13 comprehends the second half of the present century, which the author calls "modern science of medicine." According to his opinion, it appears to advance more and more towards its perfection. We have many systems of nosology, and are still improving upon them; yet none has been hitherto universally adopted. Pathology is the least cultivated branch of medical science; but anatomy and chemistry have made the greatest progress.

ART. LIX. IDEEN ZUR DIAGNOSTIK, &c. *Considerations on Diagnosis, communicated to attentive Physicians.* By J. E. WICHMANN. Vol. I, 8vo. pp. xvi. and 196. Hanover. Helwing.

**I**T has been hitherto a great defect in our pathological manuals, as well as our nosologies, that notwithstanding they point out into how many species every disease may be divided, and what may be the obvious causes of their origin, they never (or at least very superficially) inform us of the symptoms by which one species may be distinguished from another. The nosologists have pretty generally indulged their inclination of forming genera and species; they have furnished their systems with many kinds and varieties of diseases which were contrived for the sole purpose of filling up a vacant place in their books, and the existence of which has never been confirmed by experience. The systems of Sauvages, Daniel, Ploucquet, and particularly that of Wedekind, afford sufficient proofs of this; the latter, for instance, speaks of *Pancreatitis*! a disease which never existed in nature. This absurdity, introduced by systematics, will probably  
not



not be relinquished till authors like Wichmann will, in every instance, set out with the strongest conviction, that the *indulgere genio* is in no department of human knowledge so mischievous as in the science of medicine, and that the physician is least of all entitled to dispense with experience. Hence, the author's resolution of analysing the diagnosis of those diseases only, which he has had an opportunity of observing, deserves every praise. He furnishes us, at the same time, with an account of the pathological dissections of bodies, accompanied with practical reflections. His well-known spirit of observation, his acute judgment, and his love of truth, warrant our hope that he will acquaint us with no other but such species of diseases as are confirmed by actual experience. Of every kind of sophistry, especially that which was so very fashionable in later times, the author declares himself a resolute enemy; we therefore trust he will be constantly upon his guard against it. His performance demands repeated and careful study; for, according to the ideal establishment of the German republic of letters, it claims a rank among those books which must be placed behind the golden screen, if their contents, as well as the manner of stating them, be new, and promise real advantages to science. The author has not arranged the diseases, of which he treats in this first volume, according to any particular system; for as he communicates merely the result of his own experience, such an arrangement would have been superfluous. He treats therefore,

1. Of the *Crusta lactea*, (*Milchborke*) and its distinction from a more obstinate cutaneous disease, the *Crusta serpiginosa*, with which it has been frequently confounded by practitioners.
2. Of the proper *Zona* or *Ignis sacer* (*der eigentliche Gurtel*) which very much resembles the *Erysipelas vesiculosum*. (*Blatterrose*)
3. Of *Petechiæ*, as distinguished from Werlhof's blotched disease. (*die Fleckenkrankheit*) The author also judiciously distinguishes the latter disease from scurvy, and censures those physicians who look for scurvy upon the continent. "Petechiæ are never critical."
4. Of *Struma*, *Scrophula*, *Bronchocele*,



*Bronchocele, Cynanche Parotidæa, and Chalaza.* The three first of these maladies were formerly very often confounded; the Struma in particular has often been treated as a scrophulous disease, especially by practitioners in England. 5. Of *Chorea* and *Raphania*. The author shews, that the idea which the physicians in England have of chorea is different from that of the Germans. 6. Of chronic vomiting; a very interesting and judicious treatise.

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ART. LX. LEITFADEN FÜR ANGEHENDE AERZTE, KRANKF ZU PRUFEN, UND KRANKHEITEN ZU ER-FORSCHEN, &c. *A Guide to young Practitioners of Physic, pointing out the manner of examining Patients, and of inquiring into Diseases; with a table of diseases, and of meteorological observations.* By J. F. GOTTHARD the younger, Professor at Bamberg. 8vo. 264 pp. 1793. Erlangen. Palm.

MR. Gotthard, who is a true pupil of the schools of Vienna and Mayence, enjoyed for three years the instructions and the friendship of Stoll. He presents us in this production with the art of examining patients, in which Stoll particularly excelled. The loss of this great teacher is more severely felt when we observe that he has reared such pupils, and when, at the same time, we become more intimately acquainted with his manner of treating patients, and of inquiring into the state of their health. The application of the inquiry to the different species of fevers, p. 200, and the concise character of every individual species, with its distinguishing symptoms, is as much connected with the doctrine of diagnosis, as the observations on the pulse, &c. p. 147, are related to semeiotics, so that even on this account it will be useful and interesting to the young practitioner. Though the author modestly dedicates this performance to beginners, yet even the experienced practitioner will not peruse it without advantage; for it will remind him  
of



of many things that might otherwise have escaped his recollection. The whole work is a commentary upon Stoll's method of examining patients, as published by Eyerel in his *Sylloge*. Mr. Gotthard has also availed himself of the observations made by the latest and most authentic writers, whom he quotes in confirmation of what he advances in his book: besides these we find many new remarks of his own.

ART. LXI. HANDBUCH DER PRAKTISCHEN HEILMITTELLEHRE, &c. *Synopsis of practical Pharmacy, for the Use of young Practitioners in Medicine.* By W. GESENIUS, M. D. — 8vo. viii. and 697 pp. 1791. — Stendal. Franzen and Grosse.

IT appeared to the author, that such a synopsis of pharmacy was yet wanting, as might contain an accurate detail of the application of remedies in particular cases; might point out the causes of diseases, and exhibit, at the same time, in a clear and concise manner, those observations of the best physicians, which contribute towards ascertaining the value and efficacy of medical remedies, the most proper form of administering them, their dose, their combinations, and the various circumstances in which they have been found most effectual. Though it be sometimes very difficult to decide with precision upon matters of pharmacy, particularly when we attempt to explain the manner in which remedies operate; yet the author has endeavoured, and not without success, to overcome these difficulties. Hence this work cannot fail to be of service, and we recommend it as one of the most useful to young practitioners; provided they are not attached to any empirical system, but wish to cure diseases by the exercise of reason and sound principles. We find here the remedies arranged according to the indications of cure, and according to their effects. This is so far advantageous, that the beginner in practice finds instantly, not only all those remedies placed together, which



which coincide in their effects, but also the circumstances stated, in which one remedy is preferable to another possessing similar powers. To every section the author has judiciously premised some general remarks consisting of abstracts from pathology and therapeutics: by these the just indications and contra-indications in the application of remedies are distinctly marked.

In the Introduction Dr. Gesenius gives a concise, yet pretty complete view of pharmacy and pharmaceutical chemistry, ancient as well as modern. It would, however, have been an additional recommendation, if the author had given a short critical account of all those works which he has only incidentally mentioned. Monographical writings, whether upon individual remedies, or their peculiar effects, are quoted in their proper places. With respect to the choice of the medical remedies treated of in this work, we feel no inclination to contend with the learned author as to their efficacy, or to inquire whether there may not be others that equally deserve a place in this collection: while on the other hand, we must acknowledge that he has introduced some valuable remedies which, either have not yet found their way into the modern British pharmacopoeias, or have been upon slight grounds estranged from them. Upon the whole, we must do him the justice to say, that he has treated the principal articles with uncommon ability; that he has avoided prolixity, and fairly stated whatever deserves to be known; and this he has done in excellent order, particularly when speaking of the Peruvian bark, camphire, opium, mercury, &c.

ART. LXII. *Select Cases in Midwifery ; extracted from the Records of the Edinburgh General Lying-in Hospital, with Remarks.* By JAMES HAMILTON, jun. M. D. *Assistant Physician to the Hospital.* — 8vo. 159 pages, price 3s. 6d. — JOHNSON, London.

MANY advantages, the author observes, result from the publication of cases. The characteristics of diseases are thereby impressed on the minds of young practitioners ; the ordinary rules of practice are illustrated ; and the value of expedients that are not universally sanctioned is ascertained. In short, by this means the experience of the individual is rendered generally useful.

Cases in midwifery have been published by Messrs. Mauriceau, Lamotte, Giffard, Portal, Smellie, and Perfect. But although these publications be on the whole very valuable, it must be allowed, that they are deficient in one of two respects, viz. either inaccuracy in the detail of symptoms, or imperfection in the mode of treatment pursued. The following therefore being calculated to supply those defects, it is presumed will form a proper supplement to the former publications of the same kind.

That they may serve this purpose, the editor has endeavoured to exhibit the striking features of each case ; has, by remarks, illustrated the mode of practice ; and has selected only such cases as claim attention from their importance.

The subject of the first case is the recovery of still-born children. The following observations are offered respecting the management of those born in an apoplectic state.

The propriety of blood-letting, the author observes, is sufficiently apparent. That in general ought to be the only means employed ; for after a small discharge of blood, the infant commonly begins to breathe, though very imperfectly. If this happen, the whole process should then be left to nature ; as the use of stimulants under such circumstances constantly tends to interrupt the



the process. Many children have been lost to society from this cause. But, if notwithstanding the bleeding, the infant remains in a state of insensibility, it should be wrapt up in warm flannel, and the lungs should be artificially distended with air, so that the operation of breathing may be imitated.

Many contrivances have been adopted for this purpose. The most common is a goose-quill or piece of tobacco pipe. But if these be used, the air thrown in, from having passed through the lungs of an adult, is deleterious. A pair of bellows, capable of containing no more air than what will distend the lungs of a foetus, may be constructed, so as to be conveniently portable. But the expedient always employed in the Edinburgh Lying-in-hospital appears the simplest and the best. It is a bag of elastic gum, capable of containing about three ounces of fluid, to which an ivory conical pipe is fixed. This pipe is introduced into one nostril, while the other and the mouth are kept quite close. By this means the lungs can be distended with pure atmospheric air as often as is necessary. Unless it be passed through the nostril, the air would fill the stomach instead of the lungs.

*Case 2.* On protrusion of the vesica urinaria during labour. This, with a little attention, may be readily distinguished from the membranous bag formed by the ovum, and affords no particular indication of treatment.

*Case 3.* Circumstances that render the application of the long forceps necessary. In this case, on the third day, the integuments of the child's head burst by the force of the labour pains, and the brain was discharged, superceding the necessity for the performance of *embryulcia*. Two circumstances alone, the author observes, render the employment of the long forceps eligible or even warrantable. First, the necessity of speedy delivery, while there are no pains, and the head is beyond the reach of short forceps, and the apertures of the pelvis are under the usual dimensions. And, secondly, the necessity of immediate delivery, where the head is in the  
same

same situation, but where the apertures of the pelvis are natural and the soft parts are relaxed.

*Case 4.* Tumours of the child's head, sometimes occasioned by the pressure of the bones of the pelvis.

Order II. *Case 1.* Danger to be always dreaded when the pulse continues quick on the second day after delivery.

Order III. *Case 1.* Mode of action of the forceps, &c. *Case 2.* Bad effects of impure air on the process of parturition. *Case 3.* Mode of practice when the short diameter of the pelvis falls under three inches, ascertained. *Case 4.* Exception to the general rule of employing Lowder's lever, or the long forceps, before the operation of embryulcia be had recourse to. — Offication of the placenta productive of much danger; how distinguished: practice in such cases.

PRÆTERNATURAL LABOURS. Order I. *Case 1.* Practice in footling cases, not yet clearly explained by authors.—Pointed out.—*Case 2.* The foetus in utero often destroyed by lues venerea. — Its appearance when destroyed by that cause.

Order II. *Cases 1 & 2.* Utility of opium in arm presentations. Advantages resulting from bringing down both feet in the operation of turning, &c. *Case 3.* Spontaneous evolution, when the arm presents, does not always take place, even although left entirely to nature.—Means by which it may be known whether evolution will happen. — Great dangers result from delaying the operation of turning, when ascertained to be necessary.

COMPLEX LABOURS. *Case 1.* Hæmorrhagy after delivery, to a certain extent, beneficial in twin cases. — Practice where the inflammatory diathesis prevails strongly in the puerperal state. *Case 2.* Compression of the abdomen after the birth of a first child necessary in twin-cases.—Mode of delivery in knee-presentations — Consequence of anastomoses of the placenta, &c. *Case 3.* Reports of patients never to be relied on. — Consequences of exposure to impure air and noise after delivery.



livery. — Phrenitis in puerperal women generally fatal; may be prevented; the means for that purpose.

RUPTURED UTERUS. Seat of laceration of the uterus. — Causes. — Symptoms indicating threatening rupture. — How remedied. — Symptoms denoting actual rupture. — Practice to be adopted in such cases.

From the above synopsis the general contents of the present publication will appear. We extract the following case of rupture of the uterus, terminating favourably :

‘ Mrs. M’Kay, out-patient, aged thirty-three years, nearly at the full period of utero-gestation, having, on the 19th November 1794, been occupied in considerable bodily exertion, felt the membranes suddenly give way; in consequence of which the liquor amnii was discharged. As she did not shift her cloaths for several hours, but continued in a cold, wet, uncomfortable situation during all that time, she had next morning symptoms of catarrh. Labour pains did not take place till the evening of the 21st, when she sent for her midwife. At midnight the incipient dilatation of the os tincæ was ascertained.

‘ During the night the pains were strong and frequent, and the head of the child appeared to descend; but the parietes of the os tincæ were very rigid.

‘ Between eleven and twelve o’clock noon of the 22d, the child’s head seemed pretty low in the pelvis; but about that time the patient suddenly cried out, during a pain, that something had burst within her, and asked the midwife, if she did not hear the noise of a rent? Immediately after this a little blood was discharged from the parts, violent vomiting and breathlessness took place, and she complained constantly of excessive pain in the abdomen. From this moment too the labour throes ceased.

‘ In this situation the patient continued till about seven o’clock P. M. when extraordinary assistance was procured. It was then found, that besides the symptoms above-mentioned, the pulse was quite indistinct, and the limbs of the infant could be distinguished under the parietes of the abdomen. The head was a little within

the brim of the pelvis, which cavity seemed very roomy, and the soft parts were quite relaxed.

From these symptoms, and from the previous history, it appeared very evident that the uterus had become ruptured, and that part of the child had escaped into the abdomen. The midwife, too, allowed, that the head had formerly been lower in the pelvis than it now was.

As immediate delivery became indispensable, and as there was no certain sign of the infant's death, the long forceps were cautiously applied; but on bringing the blades together, the head slipped out from between them, and receded entirely into the cavity of the abdomen. Those instruments were therefore withdrawn, and the hand of the operator was immediately introduced, with a view to bring down if possible the feet of the child. In this attempt some difficulty was felt, from the rent in the uterus having become much contracted. The hand, however, was passed through it, and the child was felt surrounded by intestines. One foot was taken hold of, and brought down, and the belly having been turned toward the right sacro-iliac synchondrosis, the delivery was accomplished within a few minutes; the placenta was brought off along with the child. The hand was again introduced in order to prevent any portion of the intestinal canal from passing through the laceration. The situation of the rent was so immediately above the pubes, that it appeared wonderful how it had not communicated to the bladder. It extended in a transverse direction.

During the extraction of the child, a considerable quantity of blood was discharged, and the hæmorrhagy continued for some time after delivery; so that above three pounds of blood were probably lost. Immediately after delivery the patient had a violent fit of retching and vomiting, her pulse sunk entirely, and her extremities became cold. A little warm spirits and water were given her, after which she gradually recruited, so that within an hour from the time of delivery, namely, at  
 nine



nine o'clock P. M. her pulse was pretty firm, and did not exceed a hundred and twenty strokes in the minute. She had forty drops of laudanum, and was left for the night.

‘ *After treatment.* Nov. 23d. Has had no retching nor vomiting since ten o'clock last night. Slept some hours. Has made water twice naturally since delivery; but has had no stool. Pulse a hundred and twenty, and feeble. Tongue clean; skin moist. Abdomen so very painful to the touch, that she can scarcely suffer the application of the hand. Lochial discharge quite natural, both with respect to quantity and appearance.

‘ Cap. jus a carn. bovin. (vernacule *beef tea* vocat.)  
lb. ij in die.

‘ *Vespere.* Has sweated much since the morning; complains greatly of pain in the abdomen. Pulse a hundred and twenty, and stronger and fuller than in the morning. Tongue clean; has a circumscribed redness in the cheeks. Is distressed with frequent tickling cough, which aggravates the pain in the belly. Passes urine naturally without any difficulty. Lochia perfectly regular.

‘ 24th. Has had little sleep; cough still troublesome; pulse a hundred and twenty, and weaker than yesterday; tongue clean; florid spot on each cheek. Complains of the sensation of a fluid rolling from side to side within the abdomen, when she attempts to turn herself. Cannot yet bear the slightest pressure on the belly.

‘ Cont. jus e carn. bovin. Cap. vini rubr. i oz. viij.  
in diem.

‘ *Vespere.* During the afternoon had a return of vomiting; the matter thrown up was of a dark green colour, and of a very viscid consistence. The urine she passes is turbid, and has a bloody appearance. Pulse a hundred and thirty, and very weak; tongue clean; skin moist. Has had no stool. Lochial discharge continues regular.

‘ Inj. En. ex mucil. amyl. cum tinct. opii gtt. lxxx.

‘ 25th. Slept pretty well during the night ; still complains of pain in the abdomen, and of the sensation of fluid within it. Pulse a hundred, and full ; tongue dry, and somewhat furred ; has no thirst. Can scarcely be prevailed upon to take the beef tea, or food of any kind. Had a stool naturally yesterday. Lochial discharge regular.

‘ *Vespere.* Vomited twice during the course of the forenoon ; the matter thrown up, had not the æruginous appearance observed in that of yesterday, but seemed to consist of phlegm. During the afternoon had several loose stools without pain, and of a natural appearance. Pulse a hundred and ten ; tongue only slightly furred. Face flushed, and skin hot and dry, except in some parts of the body, where a moisture is felt.

‘ Cap. pulv. antim. gr. viii. statim. et post horam ejusmodi gr. iv.—Cap. etiam tinct. opii gtt. xl.

‘ 26th. Has had no sleep during the night ; but has sweated profusely. Pulse a hundred, and weak ; tongue a little furred. Has had two loose stools since yesterday ; feels great difficulty in making water, and complains much of pain in the lumbar region and over the abdomen. Lochial discharge still regular.

‘ *Vespere.* Pulse a hundred and eight, and feeble. Has been able to pass no water for several hours. In other respects as in the morning.

‘ Fov. abdom. per semi-horam. Cap. tinct. opii gtt. xl. h. s.

‘ 27th. Passed a restless night, and feels general uneasiness. Pulse a hundred, and weak ; tongue white ; skin moist. Made some water with great difficulty last night, on account of which the fomentations were not applied ; but has passed none since that time. Has had no stool. Still complains of pain in the loins and abdomen. Lochial discharge regular.

‘ Fov. stat. abdom.

‘ *Vespere.* Has had suppression of urine for sixteen or eighteen hours, and feels much uneasiness in consequence.



quence. Pulse a hundred and sixteen. In other respects as in the morning.

‘ Inj. stat. enem. dom. Cap. h. s. tinct. opii gtt. xl.

‘ 28th. The enema operated well, having produced a discharge both of fæces and of urine. Has had no sleep, and feels excessively fatigued. Pain in the abdomen and lumbar region still continues. Pulse a hundred, and not strong; tongue clean; skin moist. Passes urine pretty easily. Lochia regular.

‘ *Vespere.* Has taken a little bread-berry with wine; but has had no sleep. Pulse a hundred and four. No other change since the morning.

‘ Rep. tinct. opii gtt. xl. h. s. et ejusmodi gtt. xx. post horas tres si opus erit.

‘ 29th. Complains that she has not had a single hour’s rest. Pains in the belly and loins as distressing as ever. Pulse a hundred and twenty, and feeble; tongue clean; skin moist. Has had no stool. Cannot be prevailed on to take nourishment of any kind, dislikes the wine, and will taste nothing but very weak small beer.

‘ Inj. stat. en. domest. R. Tinct. opii. dr. ii. Spt.

Ammon. arom. dr. iii. Syr. com. oz. i. —

Aq. rosar. oz. vii. M. Cap. coch. mens. No.

ii. hora somni, et No. i. 3tia. q. q. hora, nisi dorm.

‘ 30th. Has been exceedingly uneasy and restless during the night. Had no sleep; the enema was not administered, hence has not yet had any stool. Pain in the abdomen and loins still very distressing. Pulse a hundred, and pretty firm; tongue clean; no thirst. Lochial discharge moderate and quite regular.

‘ Hab. stat. en. domest.

‘ *Vespere.* Enema operated well; feels herself wonderfully better. Pulse ninety-six, and strong. Pains in the loins and belly are considerably alleviated. Abdomen still very painful to the touch.

‘ Cont. mixt. anod.

‘ Dec. 1st. Had her bed and body linens shifted last night, and did not appear much fatigued in conse-

quence. Had some hours sleep. Thinks herself greatly better. Pulse ninety and firm. Tongue pretty clean. Skin moist. Had a natural stool this morning. Makes water without difficulty. Lochial discharge natural.

‘ Cont. remedia.

‘ Diet left to her own choice.

‘ 2d. Convalescent. Eat some beef stakes yesterday. Is still very weak, and cannot yet bear any pressure on the abdomen.

‘ 3d. Continues convalescent. Sat up for an hour yesterday, without much fatigue.

8th. ‘ Left in a state of progressive convalescence.

‘ *Remarks.* Rupture of the uterus has been with great reason regarded as the most dangerous accident which can happen during labour. The numerous histories of the case on record exhibit only a very few instances where the life of the patient was saved.

‘ Laceration of the uterus may take place, and in fact has happened, in every different part of the organ, and in every variety of direction; but its most common seat is in the cervix, towards the promontory of the sacrum, and its most ordinary direction is transverse. The causes of this accident are, external injuries; the long continued violent action of the uterus after the discharge of the liquor amnii, while the os tincæ is undilated; and the ill-directed efforts of a practitioner to alter the position of the child.

‘ The preceding case is an example of effects of the second cause. The title of spontaneous rupture of the uterus has been applied to such cases; but in the opinion of the author of these remarks, this demonstration is improper, since it tends to inculcate an erroneous idea of the nature of the case.

‘ When the liquor amnii has been discharged before the dilatation of the os tincæ, if strong labour throes occur, some part of the uterus must give way; hence if the os uteri be not forced open, a laceration must happen in the part that is weakest or most pressed upon. But as certain symptoms announce the approach of this event,



event, and as it is in the power of the practitioner to avert the impending danger, what has been called spontaneous rupture is to be imputed to the fault of the practitioner, as much as that produced by his ill directed attempts to turn the child.

• Dr. Douglass first hinted at the signs which indicate threatening rupture from this (second) cause. He has not however stated them with the precision that is necessary to direct practice. The following circumstances point it out clearly. First, the liquor amnii is prematurely discharged: Secondly, the os uteri remains remarkably rigid: Thirdly, the uterine contractions are very violent and frequent; and, lastly, the patient complains of a most excruciating pain in some part of the uterus, during every labour throe. This pain differs from that often felt in the lumbar region in the second stage of labour, in being peculiarly agonizing.

• Where these symptoms occur, the views of the practitioner ought to be directed towards two objects; First, to suspend the action of the uterus, and secondly, to promote the dilatation of the os tincæ. The same means accomplish both purposes, viz. Blood letting and opiates. The quantity of blood drawn ought to be as great as the patient can with safety bear, and after the operation a large dose of tinct. opii. should be given.

• Perhaps this practice ought to be extended to every case where the liquor amnii has been evacuated before the dilatation of the mouth of the womb, if the pains be frequent; for the uterus may be lacerated during a single pain.

• The symptoms that appear after the rupture has happened, mark very unequivocally the nature of the case. The patient is sensible of something having given way within her during a pain; the labour throes from that moment cease; vomiting and breathlessness supervene; at the same time there is a small discharge of blood from the vagina. The former presenting part of the child generally recedes, but sometimes, from it being very firmly impacted into the pelvis, this does not happen.



happen. In every case, however, the limbs of the infant can be plainly distinguished through the abdominal parietes. From this period great pain is felt in the belly; the breathlessness continues to encrease; the pulse becomes very quick and irregular; coldness of the extremities, followed by deliquium or convulsions, ensues; and the patient, if no assistance be afforded, soon after sinks. Instances where women have survived this accident, and have recovered, though the child was allowed to remain in the cavity of the belly have been recorded by authors; but their authenticity can only be believed by the credulous.

‘ In cases of ruptured uterus, two plans may be pursued by the practitioner: First, the patient may be left to her fate; or, secondly, immediate delivery may be attempted. The former of these has unfortunately been too often adopted. It has been recommended by the most plausible arguments, viz. that the woman may live many years with the child in the abdominal cavity; while any attempts to deliver, may induce much injury, by increasing the extent of the laceration, &c. To one who considers for a moment the consequences of the child escaping from the uterus into the abdominal cavity, it must appear singular that such opinions should have prevailed. This doctrine has been controverted by Dr. Douglas, with great ability, on principles both of theory and practice.—The case of Mackay affords, perhaps, a more satisfactory proof of the advantages of delivery under such circumstances, than any yet published. The whole body of the infant had been for seven hours in the cavity of the abdomen, and the patient seemed sinking very rapidly; immediate delivery therefore was obviously the only resource.

‘ The long forceps were employed as the means most conducive to the safety of both mother and child; for it appeared, that if any attempt were made to turn, the laceration of the uterus might be increased, while an additional irritation would be applied to the intestines; and that if the crotchet were employed, there would be  
a risk



a risk of destroying life, since there were no unequivocal signs of the infant being dead. As the passages were very roomy, and the soft parts quite relaxed, it was rendered probable, that the use of the long forceps would be successful. But in this expectation the author of these remarks was much disappointed; for on the handles of the instrument being brought together, the head slipped out from between the blades. This must have happened from the concurrence of two causes; first the instrument's not having been placed immediately over the parietal protuberances; and, secondly, the action of the uterus having been excited by the irritation of the forceps. The child having thus escaped completely into the belly, bringing down the feet now became indispensable. In making this attempt, the assistant pupil who assisted felt it very difficult to pass his hand through the laceration, so closely had the lips united. During the process of extraction, the increase of the rent was clearly ascertained by the author of these remarks. The placenta followed the body of the child, so that it too had been forced into the belly.

‘ The event of this case, as well as of that detailed by Dr. A. Hamilton, shews, that even although the original rent be increased in the attempt to deliver, the patient may recover. Foreign practitioners have advised on such occasions, with a view to avoid this circumstance, an opening to be made through the parietes of the abdomen, instead of extracting the child by the natural passages; but that practice would greatly add to the dangers necessarily attending the case.

‘ In the after-treatment, the first object should be to prevent any portion of the intestinal canal being included between the lips of the wound; and after that is accomplished, every attention ought to be paid to obviate inflammation, or at least to moderate the violence of inflammatory symptoms.

‘ It is remarkable, that in the case of Mackay there was no apparent suppuration, as the lochial discharge continued in every respect regular. That inflammation  
of



of the uterus to a certain extent had taken place, was evident from the suppression of urine on the fifth day after delivery. The fluid which was effused into the abdomen had been absorbed. The patient's stomach was so exceedingly irritable, that the Peruvian bark could not be given.

‘ Upon the whole, this case clearly demonstrates the dangers which result from the premature discharge of the liquor amnii, and the necessity of suspending the action of the uterus, under such circumstances, until the os tinæ be fully dilated; principles that cannot be too strongly impressed on the mind of every practitioner of midwifery. It shews too, that even in cases the most hopeless, the state of the patient ought never to be regarded as desperate.’

ART. LXIII. *Observations on the Tussis Convulsiva, or Hooping Cough, as read at the Lyceum Medicum Londinense: Wherein the Nature, Cause, and Cure of this Disease are endeavoured to be demonstrated, and the Practice of exhibiting Emetics shewn to be pernicious and useless.* By JOHN GALE JONES.—8vo. 36 pages, price 1s. ALLEN & WEST, London. 1795.

THE tussis convulsiva is here defined to be ‘ a disease of clear and evident debility; and one which never takes place, but in those who have either been previously weakened by some other disease, or who, from some unknown or unforeseen cause, are predisposed to this state.’ Children, the author observes, from four months to twelve years, are in a remarkable manner affected by it, and he has seen *but one* instance of its taking place in one of riper years.

Its primary cause is *contagion*, which *he conjectures*, is of the same nature with that whereby all infectious diseases are produced; and which, differing only in modification, or degree, occasions sometimes small-pox, or measles, sometimes typhus, or hooping cough. The  
proximate



proximate causes are said to be all such as tend to induce debility.

Its immediate seat the author places in the exhalant and mucous arteries: the secreted fluids of which being inspissated by stagnation in the bronchia, form the matter of expectoration; the unpleasant sensation of the stimulus *excites a commotion in the vitality of the labouring part, and rouses the whole excitement* for its expulsion.

On the nature of contagion and its mode of action, we have the following observations: ‘Contagion is a certain subtle imperceptible matter, of an unknown nature, resembling most natural phenomena, which are only in any measure open to our enquiry by their evident effects. Taken from the body of one affected with it, or from gross substance, (such as cloaths, or furniture, where it happens to have been lurking) and received into a healthy body, it ferments without any change of the solids or fluids, fills all the vessels, and is gradually ejected by the pores, passing out more copiously or scantily, in proportion as the perspiration is more free or impeded.

‘As the issue of the matter is here promoted, by inducing a free perspiration; so whatever part of it be obstructed, and detained below the cuticle, acquires, by this delay, a certain acrimony, producing little inflammations, and conducting them, when produced, to supuration. Upon this principle are the small-pox, measles, and other exanthematous diseases to be accounted for.

‘As contagion however requires a certain time for its transmission; it follows, that the most favourable state for this purpose will be that where the different secretions are most perfectly performed; and where, consequently, the system comes the nearest to the healthy state; for it is very evident from daily experience, that in weakened or vitiated habits, where the functions are ill performed, and where perspiration is deficient, it is capable, by its detention, of infecting peculiar fluids, and converting them into a matter similar to itself.

Yet



Yet as contagion, by its subtle and peculiar nature, is found to be imbibed by all habits (perfect health perhaps alone excepted) I am unwilling to allow that it possesses any share in producing general diathesis; but that it kindles up only a symptomatic pyrexia, strictly entitled to the appellation of local disease; and, by its entrance into a healthy, or unhealthy constitution, produces those different effects which are seen to proceed from it.'

This disease then being *proved* to be a disease of debility, cordials, wine, bark and opium, must be efficacious. In fact, so efficacious is this mode of treatment, that the author says (and we may believe him) that he has never had a case of whooping-cough which did not yield to it.

After the above it was unnecessary in the author to remind the reader, 'that he would readily perceive that it was the work of a very young, and perhaps inexperienced man; or, 'that he has established his mode of reasoning upon the fundamental principles of the Brunonian system; for the author of which he entertains the most profound veneration and esteem.' It is his intention, he observes, to present the public with a commentary and defence of this truly valuable though much persecuted doctrine.

ART. LXIV. *Experiments on the insensible Perspiration of the human Body, shewing its Affinity to Respiration. Published originally in 1779, and now republished with Additions and Corrections.* — By WM. CRUIKSHANK, 8vo. 104 pages, price 3s. 6d. — NICOL, London. 1795.

WE find prefixed to these experiments some observations on the skin and its pores, first published in 1779.

With respect to the formation of the cuticle, Mr. Cruikshank dissents from the former opinions which have been



been held on the subject. These have been two. The *first* is, that it consists of the callous extremities of the vessels of the skin, reduced to this state by the friction which perpetually takes place between the surface of the body, and substances coming in contact with it. *Morgani* adopted this opinion.

The *second* is, that cuticle and *rete mucosum* were originally and still are exsudations of mucus from the ends of the vessels of the skin, that this mucus is dried and hardened by the external atmosphere into a membrane. This last opinion has been supported by professor *Meckel*, who observes, in confirmation of his opinion, that the black membrane in the *rete mucosum* of the negro, may still be dissolved in water, like mucus by maceration. In support of his own opinion Mr. Cruikshank adduces the following arguments:

‘ The known properties of cuticle do not correspond with either of these theories. If the friction of external substances rendered the ends of the vessels of the skin callous, whence have we cuticle so perfect in the earliest state of the tender foetus, hanging in a warm liquid, more fit for dissolving, as one would imagine, than producing callosity? If the cuticle, on the other hand, is merely concreted mucus, whence should the dead cuticle remain months in water without dissolving, or becoming putrid? The hoofs, nails, and cuticle, of animals, are supposed to be similar substances, and always come away together after maceration in water; yet the hoof in the flink calf is almost an inch thick, while the cuticle is nearly the same as it is afterwards in open air.—I formerly mentioned, that the cuticle, unlike dried mucus, neither in the living nor dead body, admitted of the transuding of fluids. Dr. Hunter observes, in the publication already mentioned, that the fine membrane in the rind of fruit, such as lemons and oranges, has the same property, as is demonstrable from the drying and shrinking of the fruit, when this membrane is removed; whereas, if it is kept entire, the fruit may be preserved for many months.

‘ I cannot



‘ I cannot well suppose any part of the skin of a living animal inorganic and not possessed of life. If the cuticle, though an insensible membrane, were not alive, and possessed of irritability, why should touching it with caustic, which deprives other parts of life, and makes them drop off, have the same effect on the cuticle?—If a bit of cuticle is touched slightly with moist lunar caustic, it soon becomes black, and in a day or two drops off, shewing a new surface in every respect like the former. I do not admit that this is new cuticle, so quickly regenerated, but the cuticular surface of rete mucosum, which has the same appearance, and the same properties as the cuticle.—Spirit of nitre dropt on the cuticle turns it yellow, and produces, though more slowly, the same effect as the lunar caustic does.

‘ The substance of the teeth, like the cuticle, has been supposed to have no vessels, though it was originally deposited by vessels; and there are several circumstances which favour this opinion; yet in attempting to saw a tooth in the living body, the patient complained of pain the moment the saw got through the enamel. If there are nerves in the bony part of a tooth, there can be no doubt of its also having vessels.—Cartilages covering the ends of bones, in the full grown animal, have not the least vestige of vessel, that can be demonstrated. But cartilage may be absorbed as well as bone; and if in the diseased state it is most probably vascular, it must have been so in the sound state.

‘ Having formerly observed, that the brain steeped for months in spirit of sea-salt, instead of being dissolved, like the muscular flesh, or like the viscera of the thorax and abdomen, becomes harder and firmer, I wanted to see what effect concentrated acids would have upon the cuticle.—I took a piece of the cuticle of a child at birth, and divided it into three portions; each of these might be about an inch square, and were put into separate glasses, and spread out. Two drachms of vitriolic acid was poured upon the first, two drachms of nitrous acid upon the second, and the same quantity of spirit



spirit of sea-salt, upon the third. After they had remained an hour in the acids, I found that they were not dissolved; I washed them in water, and examined them particularly. That which had been put into the vitriolic acid, had, in some degree lost its colour, and was become brownish, but was not however, in the least dissolved, and the processes were exceedingly distinct; it was not more tender to the touch, or to the endeavour to pull it asunder, than before; nor had it lost its elasticity, except in a small degree. That which had been put into the nitrous acid, though it was not dissolved, had split into different pieces, and was more pulpy than before, like a piece of dead cuticle from the sole of the foot, macerated in warm water; it was also more tender, did not bear handling so well, but the processes and natural texture of the skin were still apparent; it had lost nearly all elasticity. That on which the strong spirit of sea-salt had been poured, appeared to have suffered least, and had not even lost its colour in the smallest degree; it had not lost its elasticity in any degree, nor was it apparently altered as to its texture; the minute processes themselves had undergone no change, and it could be handled with as little injury as before;—these are properties in the cuticle which by no means correspond with callous vessels or concreted mucus. A very remarkable circumstance in one of these experiments was, that though the nitrous acid gives the cuticle a yellow colour, if it touches it while it adheres to the living body, it had no immediate effect of this kind upon the separated cuticle; nor did I perceive that it was yellow, till next morning, after it had been many hours in water. I repeated these experiments with cuticle steeped for an hour in oil of tartar, *per deliquium*, lest any thing oily on the cuticle might have prevented the acid from getting into contact with its surfaces:—the event was the same.

‘ My suspicions that the cuticle was organized have been still further confirmed, by some new observations I have made on skin, injected, with a view to shew the appearance



appearance of the small-pox pustle. I have now more reason to believe, that the cuticle, like some parts of the *conjunctiva* of the eye, though it cannot be injected in the sound state, was originally vascular, and circulated the red blood. It may still have vessels carrying transparent fluids, and I would not altogether deny, that those vessels might not sometimes be again dilated so as to be capable of receiving the red blood, or our injection.—The hairs themselves, though reputed to be inorganic, like the cuticle and nails, or like the hoofs of animals, are notwithstanding said sometimes to bleed, so as to endanger life, in the disease termed *plica polonica*.’

Though the author has not seen vessels in cuticle or rete mucosum, he has successfully injected a membrane between rete mucosum and the cutis, in the skin of those who have died of the small-pox.

‘ Taking some portions of skin, which had been kept in spirits, I macerated them in putrid water for a week, during the heat of the summer: the spirits with which they had been previously impregnated made them resist the effects of this water long. Cuticle and *rete mucosum* were already turned down; and upon the eighth or ninth day I found I could now separate a vascular membrane from the cutis, in which were also situated the injected small-pox pustules. These last consisted of circles of long floating *villi* at the circumference, but of a white uninjected substance in the centre. This central part Mr. Hunter had previously said, was a slough, formed by the irritation of the variolous matter. The surface of the skin from whence this membrane was separated, was elegantly porous. The pores now appeared exceedingly more numerous, and this surface of the skin was still tough and shining. From the vast number of pores now visible I inferred, that the processes of the cuticle and *rete mucosum* must be also more numerous than we are aware of; and many of these processes must be invisible in the microscope, from their exility and delicate texture, though their corresponding pores are visible. But as the processes of the larger pores are visible



to the naked eye, and as Dr. Hunter's white filaments are not discoverable by the microscope, after they are once tore through, the invifible proceffes I contend for, moft probably exift, and may be the laft mentioned filaments themfelves. I macerated the fame fkin for four or five days more, and feparated another membrane, more delicate than the former, but alfo vascular; the former I eafily preferved; the latter, attracted by the inftrument which feparated it, or unable to bear the agitation of the water or fpirits, in which it was feparated, constantly broke down; but the correfponding furface of the fkin was ftill tough and fhining; the pores were now much larger and more diftinct than before, and convinced me that the appearance was natural, and that the fkin had fufained no real injury in the procefs.

‘ Was I to describe the different membranes which lie on the furface of the true fkin, I fhould now fay they were five, each of which I conceive is a cuticle, or an incipient cuticle.—The three firft are evidently cuticles, and the two laft, moft probably, are forming into cuticle, and, like the fecond and third, are to fucceed the firft, which is perpetually falling off in fmall portions, like fcales—the only circumftance which feems to favour Lewenhoeck's doctrine, that the cuticle is formed of fcales.

‘ If I am ftill not perfectly underftood refpecting thefe five membranes, I repeat, that cuticle, commonly fo called, makes the firft; the *rete mucofum* is double, and makes the fecond and third; the firft vascular membrane, in which the fmall-pox puftules are chiefly feated, makes the fourth; and the membrane, which may be feparated fome days after the feparation of the laft, by continuing the maceration, and which fhews the pores ftill larger, makes the fifth. Thefe two laft membranes, I fancy, might eafily be detected in the fkins of thofe who die of the measles, fcarlet fever, or other eruptive difeafes, as well as in the fmall-pox fkin; for I conceive that thefe eruptive difeafes do not create, but demon-

strate these membranes, in consequence of the great determination of blood, in these cases, to the skin.'

With respect to the substances emitted from the skin, by perspiration, this subject has been already noticed in our account of Mr. Abernethy's experiments.\* These, as accomodated to the modern opinions in chemistry, will be much better understood than those of Mr. Cruikshank.

ART. LXV. *Medical Extracts; being a concentrated View of some late Discoveries in Chemistry, and the new Theory and Practice of Physic thereby introduced.*  
Vol. I. 8vo. Price 6s.—ROBINSONS, London, 1795.

**I**N the Dedication of this work to Sir Joseph Banks, the author observes, that "it places in a concentrated view, the late discoveries in chemistry, and the new theory and practice of physic.

' The late Dr. Hunter ventured to prophesy, that if ever the office of the lungs should be discovered, there would arise a great and sudden improvement in the science of medicine.

' This discovery has been made, to the honour of the eighteenth century, by the fortunate labours of several philosophers; and a new doctrine, grounded in part upon the knowledge of the office of the lungs, and the agency of oxygen air in the system, is instituted by Dr. Beddoes, the learned and ingenious professor of chemistry, at Oxford; which unfolds the causes of hitherto perplexing disorders, and at the same time suggests to the enlightened practitioner a rational and improved mode of treatment.

' Though no open objections were made to this new improvement in the science of medicine by any physician, yet some insinuations appear to have been early thrown out, complimentary indeed to the ingenuity of Dr. Beddoes, but exhibiting a strong prejudice  
against

\* Vide Medical Review, Vol. I. page 11.



against any alteration, even in the unsuccessful routine of practice.

‘ These attempts only served to call forth the pens of men of the highest respectability; and Dr. Darwin, Dr. Perceval, Dr. Withering, Dr. Parry, Dr. Ewart, Dr. Wood, Dr. Briggs, Dr. Thornton, and even the pupil and favourite of the late Dr. Cullen, the Rev. Mr. Townshend, did not hesitate, with the Rev. Mr. Cartwright, to deliver to the public their unbiassed testimony in favour of the new practice.

‘ The office of the lungs being known, and the alteration of the blood from oxygen air, and the influence of oxygenated blood on the nerves and animal œconomy, the study of physic is now become a pleasing and interesting pursuit. Nature appears sublime and simple in her operations. The mystery of life is laid open to our view, and we are enabled clearly to comprehend how this wonderful machine of ours depends every moment for its existence on the due supply of oxygen air to our lungs, displaying at once the wisdom and benevolence of the Almighty. Having learnt this intimate connection, we see the grounds for the new practice; and from the exertion of physicians, educated in the new school, we are led to entertain some hopes of seeing even those recovered, who have already been despaired of by their friends. We are taught, also, how to avoid many common and afflicting disorders, incident to the human frame; and, thanks to Dr. Beddoes, who stands confessedly the foremost of the new school, the way to prolongation of life and health, comparatively speaking, is made easy; and if the execution of this work has at all corresponded with the intention of the author, persons of both sexes, who have the power of fixing their minds for a few hours, and feel themselves interested in the important inquiry, will soon be initiated into the new discoveries of chemistry, and the new theory and practice of physic thereby introduced.

‘ The labours of many enlightened physicians are here presented in one body; and by notes, and some alterations

alterations in the text, and a methodical arrangement, it is hoped, they are rendered intelligible even to such as have not been accustomed to studies of this kind.'

The following is the general order of the work. — Part I. The mechanical properties of air—The chemical properties of air—The modern analysis of atmospheric air—The analysis of oxygen air—The analysis of water —The analysis of carbonic acid air, or fixed air—Analysis of adeps, or animal fat — Of putrefaction, or the resolution of organized matter into its constituent principles. Part II. The agency of oxygen air — Concise description of all the parts of the animal body—Air is absolutely necessary for the preservation of life—A due supply of air is indispensable—The chemical alterations air undergoes by being respired — An answer to this question, "What has become of the oxygen or vital portion of the air, which disappear after an animal has been for some time confined in a certain portion of air, the residue being azotic air and fixed air?" — The circulation of the blood — The office of the lungs — On animal heat — The balance between digestion and the oxygenation of the blood—How life depends on a certain degree of heat in the body — The method nature takes to increase or rid herself of this subtle and penetrating fluid—The causes of motion in the vital, or involuntary organs—The cause of motion in the voluntary organs, or muscles—Of oxygen or vital air, considered as a remedy — On tone — Of the irritable principle — Of the sentient principle—Of oxygen, as related to irritability—Of the vitality of the blood—Of oxygen, as related to sensibility.

At a future time we shall notice the remaining parts of this work, when we shall enter more minutely into its contents.



THE  
MEDICAL and CHIRURGICAL  
REVIEW.

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M A Y, 1796.

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ART. LXVI. *Discourses on the Nature and Cure of Wounds.* By J. BELL.

CONTINUED FROM PAGE 419.

**I**N our last number we concluded the author's account of wounds in general, with the treatment. In the second part, Mr. Bell treats of particular wounds; as those of the breast, belly, head, and throat.

‘When the lungs are wounded,’ the author observes, ‘the distress and danger of your patient must arise either from emphysema—or from extravasation of blood—or from the ball—or cloaths or splinters of the ribs, either lying in the cavities of the thorax, or absolutely sticking in the lungs: But besides these present dangers, there is a second train of dangerous symptoms, which you must also learn to manage, especially long continued suppuration in the breast—callosous sores—exfoliating bones—or (the wound having actually closed) there may be collections of pus within the chest, and the operation of empyema may need to be performed.’

I. *Of Blood poured out into the Cells of the Lungs.* In this case, copious bleedings are recommended: for the system being emptied in this direction, there will be less danger of immediate suffocation, and but little fear of the succeeding inflammation rising too high. It is only by these repeated bleedings, as often as the cough

and bleeding from the lungs return, that the patient can be saved; you must keep, Mr. Bell observes, the vascular system low in action, and so drain it as to prevent the lungs from being oppressed with blood.

II. *Of Blood poured out, not into the Cells of the Lungs, but into the Cavity of the Chest.* The rules of practice, in these cases, are laid down as follows. ‘ First put in your finger; perhaps it may discover, or may evacuate the blood:—If the blood do not follow the finger, then some tube must be introduced, and the tube for so simple a business need not be a nice one: If you cannot get your tube into the thorax, and the breathing continue oppressed, you must enlarge the wound, and enlarge it freely; to be afraid of exposing the lungs to air when they are already torn with a bullet, and loaded with blood, is mere childishness, and useless theory, very unlike the proper management of such wounds. If you find the wound in the thorax too high above the third or fourth rib; and if you find that no postures of the patient, however willing or able to turn himself, will bring the blood easily in that way; or, if you find the wound confused, oblique, and difficult for you to dilate, you must do an operation which, as it is commonly practised for pus in the breast, is called the operation of empyema; that is, you must make a very free incision in the line betwixt two of the ribs, then puncture the pleura with a lancet, and introduce your tube there; or, in plain language, whenever you find that the natural wound will not empty the thorax, you must not fear to make a new wound, and you will make it in what is called the chosen point, the point of election, *i. e.* low betwixt the seventh and eighth rib, that there may be an easy drain. But whenever the shot wound is about the middle of the thorax, dilate it rather, which both changes the nature of the wound and gets out the blood. When this blood proceeds from a wound of the intercostal artery, such free incisions are the more necessary; they allow us to see the artery, to feel the jet of its warm blood, by putting in the finger, and this allows



allows us to press it with a compress, or to tie it with the needle and thread.'

III. *Of Emphysema or the Tumour formed by Air, thrown out from the Lungs into the common cellular Substance, or confined within the Thorax, and oppressing the Lungs.* On this subject, Mr. Bell justly observes, that the nature and treatment of emphysema have been in general much misunderstood. 'The moment that the lungs are wounded they fall down, and continue in this collapsed state until the wound heals, which it does in the course of a very few days. From that moment the use of the wounded lobe is lost, so that if the wound be in the right side of the lungs, the breathing is performed only by the left, only half the quantity of air is inspired, and the breathing is difficult: But, this collapsed state of the lungs, which cannot be remedied, which must inevitably continue at least for a few days, while it is a cause of distress, is at the same time a chief means of safety. When the lungs are unfolded, their vessels have their full diameter, they hold their full proportion of blood; and if, after being wounded, the lungs could continue dilating at every respiration, their wounded vessels would throw out much blood; but the moment that they are wounded, they fall down to the back bone, they continue in this collapsed state, and can no more be filled than a torn bladder can be inflated; and moreover, they are oppressed by the thorax being filled within with blood or air, and this collapsed condition of the lungs prevents much loss of blood. There is less blood thrown out into the cavity of the thorax to oppress the lungs, and there is also less thrown into the bronchea, which is still a more dangerous kind of bleeding, since it threatens suffocation, not only by filling the wounded lung with blood, but by affecting both sides of the lungs.'

The strong blast of air, which rushes from the wound in the thorax, so far from being a sign of wounded lungs, is often strongest when the lungs are absolutely entire; it is a sign of a free and open wound in the thorax, but by no means of wounded lungs; for whe-



ther the lung be or be not wounded, the air enters so freely by the outward wound that there is no vacuum formed to give them play, and therefore they fall down and lie collapsed till the outward wound heal. The thorax therefore has nothing to do with the lungs, but is like a pair of bellows, having a large air-hole, which admits the air every time the breast rises; and when the breast falls again, the second motion blows it out. The air is alternately drawn in, and thrown out at every respiration, with a strong blast; but whatever air issues through the wound, had been drawn in by the wound, and had never passed through the lungs: There is no vacuum to move the lungs. The lungs, whether they be entire, or whether they be wounded, always lie collapsed.

‘ How impossible it must be to raise the wounded lung, and to renew its function, I think I shall now very easily explain, demonstrating to you at the same time, that those who have intended this effect by their free incisions, had not founded their discoveries as they have prematurely called them, on good principles; for Bromfield writes very ignorantly in that chapter, where he tries to claim the invention from Hewson. Hewson again is as vain of this trifle as if he were not rich in discoveries really honourable; and Mr. Benjamin Bell, the most excusable of all, follows them in the humble labour of gleaning and gathering up their mistakes.

‘ First then, Mr. Bromfield tells us, with great confidence in his own opinion, and great scorn of all others, “ That the wound of the lungs being ascertained, one would not imagine that any person, skilled in the true cause of the complaint, and in the danger, with a thorough knowledge of the parts, could be at a loss for an attempt *to relieve*; for in case an opening is made between the ribs, and a canula introduced, whose diameter is larger than the wound of the lungs, the air will be forced out as fast as it escapes from the lungs, therefore the lungs will have *room* for their *expansion*, and the danger of suffocation will be removed; and when once the wound of the lungs is agglutinated, and  
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the canula withdrawn, the external opening will be healed without any difficulty." The notion of the thorax being exhausted of air, before, according to the author's expression, the wound of the lungs is agglutinated, is curious. The expression, "the lungs having room for their expansion," is still more curious; but if any one should doubt whether the author could intend to say so foolish a thing, as that the lungs, not being opposed, will dilate of their own accord, let him turn over to the next page, where he will find a remark, coupled with a fact, which is most curious, *viz.* "I remember a similar happy effect, in accelerating the cure in a similar case, by the PATIENT's playing on the HAUTBOY; which, keeping the lungs forcibly distended for a long while together, kept the pleura closer to the ribs, so that the union of the separated parts, (*viz.* of the pleura and ribs,) was most likely sooner effected than if he had trusted to the ordinary respirations."

The celebrated Mr. Hewson hardly reasons more correctly than his competitor Mr. Bromfield, who so kindly permitted him to make himself known to the Society. "It is natural," says Mr. Hewson, "to suppose, that the wound of the pleura and intercostals may sometimes be too small to suffer the air to get readily out into the cellular membrane, and to inflate it, but may confine a part of it in the cavity of the thorax, so as to compress the lungs, PREVENT THEIR EXPANSION, and cause the same symptoms of tightness of the chest, quick breathing, and sense of suffocation which water does." Through all his paper we find him, in speaking of oppression of the lungs, referring only to that side which is wounded. He never once mentions the oppression of the diaphragm, or the pressure on the mediastinum, nor does he in any shape hint to us the oppression upon the lung which is sound; and, in the passage which I have just quoted, he says, that "the air within the thorax prevents the expansion of the lungs;" and, in directing how the incision is to be made,



made, he advises, that it be small, rather than large, “ for penetrating wounds of the chest are inconvenient, on account of the air’s entering by the aperture in such *quantities* as to prevent the *expansion* of the lungs.” The tendency of all this is very plain, but it is only in the writings of Mr. Benjamin Bell, who has been busied in collecting faults from all other authors, that one can have a perfect abstract of this opinion, which all of them had some faint notions of, but which he alone has obtained in perfection. He says, in the chapter above alluded to, “ we have mentioned different methods of expelling the air *from the surface* of the *lungs*, but the simplest and easiest is this: While the wound yet remains open, let the patient, in a slow gradual manner, make a full INSPIRATION, by which a considerable quantity of the collected air will be discharged. This being done, the skin must be instantly drawn over the SORE, so as to cover it completely during EXPIRATION; and if the wound be moderately opened during INSPIRATION, the whole quantity will be soon expelled.” This receipt for expelling air from the lungs, comes very naturally from the author, by whom we are told, in the chapter alluded to, “ that when a violent exertion in coughing, crying, or laughing has produced it, (*viz.* bursting of the lungs) the particular seat of the complaint will, in general, be pointed out by some degree of pain in the part where the rupture of the external coverings of the lungs *have* occurred.”

Now, whatever interest this author may have in persuading his reader that laughing is dangerous, and that the lungs may be burst by immoderate laughing, I cannot forbear wishing, that he had satisfied us so far, as to have mentioned at least one accident or fact of this kind.

“ The other means which we wish to propose” (says Mr. Bell) “ for drawing off air from the thorax, is suction: An exhausting syringe may be fitted with such a mouth, of ivory or metal, as will allow it to be closely applied over the orifice in the pleura.” And  
again



again he says, that “ as much distress has, on some occasions, ensued from both cavities of the chest being at the same time laid open, it ought never to be attempted.” And the reason given for these inconveniences, and the kind of danger that is apprehended, is not that the lungs of both sides would collapse, and breathing cease, and the man die; but it is this, that the two cavities of the chest being laid open at once, and the air being admitted into both cavities at once, both cavities would inflame at once, and that would produce “ MUCH DISTRESS.” That it might produce much distress among his friends, I will readily allow; but as for the patient’s own immediate distress, that, I believe would be soon over, and there would be little time for relieving him by sucking up the air, with an elastic gum bottle, from “ the surface of the lungs.”

‘ But the serious and plain conclusion is this, that the lungs will continue giving out air till they heal; that while they are giving out air, they must lie collapsed; that it is not desirable that they should be moved, for their lying unmoved is the best security against bleeding, and the surest way of making the wound of the lungs heal: And still further, we cannot, if we would, raise the wounded lung, nor renew its functions; it is rent so that it cannot be inflated; it is oppressed with air if the chest be close, or if the chest be open, the air passes in so freely that no vacuum can be formed to move the lungs; and as for inspiration emptying, and expiration filling the breast, it could never have been spoken of but by a person who could talk about the lungs being burst with laughing. The incisions which have been so much commended, are useful, not by raising the wounded lung, or renewing its function, for that attempt is absurd in all respects; it is needless, because though a man does not live so easily, yet he does live, and does well with one lung only (I mean breathing only with the lungs of the one side) till his cure be completed: It is impossible to accomplish it, because the wounded lungs being still open, the matter,



air, or blood, issuing from that wound, fills the thorax, and prevents a vacuum: It is useless also; for it is, as I conceive, desirable, that the lung should lie collapsed and quiet till the wound in it heal; and, therefore, those free incisions, which I approve of as much as Mr. Hewson could do, are useful only where the breast is much oppressed with accumulated blood or air; and the incision which lets out that blood or air, also lays open the thorax so as to let in the air freely, so that this free incision serves at once two good purposes; it makes the wounded lungs collapse entirely, and sets the lungs of the sound side quite free.'

The proper treatment therefore consists in puncturing through the skin, near the wound, and in other parts, and if this fails to afford relief, performing the operation for the empyema, to let out the confined air or blood.

IV. *Of extracting the Splinters of fractured Ribs, Pieces of Cloth, Balls, or other foreign Bodies.*

V. *Of supporting the Patient under the profuse Suppurations.* Under these heads, the observations contain nothing new.

Mr. Bell speaks at great length of the impropriety of employing setons and tents, to keep open the wounds of the chest, and enters into the history of the employment of these means in surgery. The danger and inconveniencies of adopting them he exemplifies by citations from the writings of authors of eminence.

On the subject of *wounds of the belly* the author offers many judicious observations. Having remarked that in these cases, art can do but little in the cure, nature herself cannot do much; we are as spectators merely, and every recovery is truly an escape; he lays down the following summary rules:

1. Bleeding from the arm is the great preservative against internal bleeding, and is the only means of preventing inflammation;—in every wound of the abdomen, you must bleed with a very liberal hand.

2. Quietness,



2. Quietness, rest, and opiates, with fomentations to the inflamed belly, are next in importance to bleeding; and the belly must be kept open with gentle glysters, but never with laxative medicines, lest they should purge.

3. The patient must very resolutely refrain from all food for ten or twelve days; for diet would support the strength, encourage the inflammation, and disturb the wound by a flux of fæces, which might, perhaps, be thrown out into the cavity of the abdomen itself. The patient must refrain from food, then, that the intestines may not be moved. He must be nourished with clysters; or if he takes any thing by the mouth, let it be some jelly or soup, which, though it were to go out into the abdomen, might be absorbed.

4. If the wound be in the belly merely, and a sound intestine be forced out, you must put it back gently with the fingers, and stitch the outward wound.

5. When there is a wounded intestine which you are warned of only by the passing out of the fæces, you must not pretend to search for it, nor put in your finger, nor expect to sew it to the wound; but you may trust that the universal pressure which prevents great effusion of blood, and collects the blood into one place; that very pressure which always causes the wounded bowels and no other to protrude, will make the two wounds, the outward wound, and the inward wound of the intestine to oppose each other, point to point; and if all be kept thus quiet, though but for one day, so lively is the tendency to inflame, that that adhesion will be begun which is to save the patient's life.

6. If indeed you have a wounded intestine fairly in your hand, protruding and plainly wounded, it were madness to let it go back into the abdomen, where there cannot but be some danger of the fæces getting out. But do not sew the bowel with a long suture, in hopes of closing the breach, nor follow the strange and whimsical inventions of cylinders of paper



per or ifinglafs, which it is eafier to ufe in experiments upon dogs, than to practice in real wounds. You muft make but one fingle ftitch, and few the wounded intefine to the outward wound—there the gut will adhere, throw out its fæces for fome time, and then heal, the outward and the inward wound uniting in one knot or fcar.

7. If a found bowel have come through a narrow wound, and be fo inflamed that you cannot push it back, you muft not think of pricking it with a needle or an awl, as was the custom of Parée, Dionis, and all the older furgeons; you muft perform the operation of hernia by flipping in your finger to guide the knife, opening the wound a little wider, till the intefine is free, and then ftitching the outer wound after the intefine is put back.

You muft take all poffible pains, both about the furgery of the wound, and in keeping down the actions of the fyftem; for you perceive that there are fuch chances as make every cafe interefting, and none desperate.

In an Appendix to this part of the work, Mr. Bell treats with no lefs juftice than feverity the doctrines laid down by his name-fake, Mr. Benjamin Bell, in his fyftem of furgery, with regard to ftitching a wounded intefine. From thefe it is very plain, as the author obferves, that the mechanical notions of this writer are utterly incorreét; that he has no conception how a gut adheres, nor how that adhefion may be affifted by a fingle ftitch, nor how impoffible it muft be for a gut to adhere, or to do any thing indeed but mortify, by being ftitched all round, and ftitched even with a double row. That a man, who has no conception of a gut being fure in any other way than by the firmnefs of his own ftitches, fhould propofe a double row of ftitches, is not wonderful; he fhould juft have put a binding round it, and fo finifhed this admirable operation.

The obfervations on *wounds of the head* are in general judicious, but have not much of novelty. The author,  
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indeed, dissuades strongly from bleeding and other evacuations in cases of concussion or compression, and advises the use of opium and wine, considering such cases as cases of debility. He would reserve his bleedings for symptoms of inflammation.

*On wounds of the throat.* Mr. Bell has spoken with much judgment. He points out the absolute necessity of thoroughly understanding the structure of these parts, and how numerous the blunders are into which writers have fallen from an ignorance of this. The chief point, he observes, to be remembered, in regard to wounds of the throat, is the relation of the carotid arteries to the trachea and larynx; the connection of the great veins and nerves; again, with the carotid artery, and the manner in which the first branch of the carotid artery goes off. First, it is to be remembered, that the arch of the aorta lies in the upper part of the chest before the trachea; and that, where the carotid arteries come out from the chest, to go up along the neck, they are scarcely at the sides of the trachea, they rather run before it: But that, as the arteries mount up the neck, they incline more to the side of the trachea; and that at the upper end of the neck, the carotids are entirely behind the trachea; for they incline towards the angle of the lower jaw, and, having reached it, they begin there to give off their branches, both those for the head and those for the neck. From this observation one thing very particular is explained,—how a wound at the lower part of the neck will very often be fatal, while a wound in the upper part of it is less dangerous. The suicide seldom strikes at the lower part of the neck; and it is by this accident of striking very high and near to the chin that the carotids escape.

Next it is to be remembered, that the carotid artery, the great jugular vein, and the par vagum, or eighth pair of nerves, lie all connected with each other very closely, being all enclosed in one mass of cellular substance, forming

forming something like a sheath. Now, since this eighth pair is one of the greatest nerves of the viscera; and since, by experiments upon animals, we know well, that a wound of it is more fatal than a wound of the brain itself; this puts an end, at once, to all questions about the way of managing wounds of the carotid artery, or of the great vein. No doubt, these may, sometimes, be partially wounded, and the nerve escape; but, in general, the nerve will be cut along with them, and, at all events, the fear of including it will prevent our striking with a needle in the neck;—we can only take up the carotid artery, when we see it bleeding with open mouth, and can pull it out with our finger and thumb; and how near it is to an impossibility, that this should happen, and the patient live till the surgeon arrive, you may easily conceive.

Next, this plain description of the connections of the trachea, œsophagus, carotid artery, vein, and nerves, explains to you how ignorantly those authors have written about wounds of the throat, who tell us, first, a formal story about the wound having passed through both trachea and œsophagus, and then, how the patient was cured;—for it is impossible to cut across both trachea and œsophagus, without wounding the carotid artery, the jugular vein, and the eighth pair of nerves; you may guess, then, whether the wounds they described were exactly what they believed them to be.

Next, their reason for saying, in such cases (so easily cured,) that the wound had passed through both the trachea and the œsophagus, is mighty childish; it is merely this—that they saw both air and food come out by the wound; and no one scruples to say, when he sees both air and food come out by the wound, that the trachea and œsophagus are both cut, while the fact is, that neither the œsophagus nor trachea are touched in the least degree—that the wound is much above them; for a suicide always strikes immediately under the chin;—his wound, as far as I have observed, commonly falls  
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in the line or furrow of the skin, which divides the neck from the chin: That is the place where the os hyoides lies, and he commonly cuts the os hyoides away from its connection with the thyroid cartilage or pomum adami. Now, in that case, the thyroid cartilage, forming the uppermost part of the larynx, is not touched; the rima glottidis lies below the wound, quite safe; the wound, indeed, separates the epiglottis from the glottis, but it leaves the glottis and the larynx quite safe; it only separates the larynx from the root of the tongue; it is properly a wound in the root of the tongue; it is rather a wound of the mouth than of the throat; and when the food comes out, along with spittle and froth, it is by rolling over the root of the tongue.

One thing more is to be remembered, that the first branch going off from the carotid artery, is the artery of the thyroid gland; that it comes off from the main artery at the angle of the jaw, and turns downwards along the side of the throat, to plunge it into its gland. Now, as this artery lies along the side of the trachea on its upper part—and as its tendency is forwards, towards the fore-part of the trachea, where the gland lies, it is much exposed, and is almost always cut—the bleeding from it is terribly profuse; the patient faints; and the surgeon naturally believes it to be the carotid artery; if the surgeon does not come early, its bleeding is as fatal as that of the carotid artery itself.

*On dangerous Wounds of the Limbs.* The author here discusses at considerable length, and with much ability, the question respecting the necessity of amputation of shattered limbs. He finds it impossible to agree with Mr. Belguer, who dissuades totally from amputation. Indeed the question at present, we believe, amongst surgeons, is universally decided. The following are Mr. Bell's general ideas on this subject.

1. "The chief cases requiring amputation are those in which the limb is crushed by a great ball, where the muscles

muscles are reduced to a mere pulp, the bones broken, the limb already nearly in a state of gangrene—or where a bomb or great bullet has broken the bones and hurt the joint, although it should not have torn the skin, either from its being an oblique ball, or from its being almost spent.

2. A limb having the great bones broken by a musket ball piercing the limb may be saved; a limb in which the secondary branches of the arteries, or even the great trunk is wounded (if the bones be unhurt) may, as in the case of any more simple aneurism, be saved. It is only the complication of aneurism, broken bones, and wounded joint, that makes the case absolutely dangerous: and since no complication of circumstances can admit of a general rule, this must be left to the discretion of the surgeon, who must prepare himself by a review of all kinds and degrees of danger, to reason upon the circumstances of each case.

3. It is but too plain, that there is a case of necessity, and a case of election, that often in a flying army, or in a dangerous camp, we must be under the distressing alternative of cutting off limbs, which, in happier circumstances, might have been saved, or of seeing our patient die a miserable and violent death. It is easier to be carried in waggons with a well amputated stump, than with swelled and broken limbs, coated with their own blood, and new arteries torn by the fractured bones at every step; and, therefore, if your patient having a terribly fractured limb, cannot lie in quiet; if you have reason to fear, that before he can arrive at any hospital, the limb will have fallen into gangrene, or the man himself be delirious or convulsed, if he have wounded arteries, which the surgeons cannot secure, and that he cannot have skilful nurses, or young surgeons to watch the bleedings, you must cut off the limb. But here also much is left to the discretion of the surgeon. Nothing seems more harsh or unfeeling, than to say that any circumstances can be an apology for a thing which should not be done; but still it is plain, that the circumstances  
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of an army, or a besieged city, make a part of the case of every individual soldier in that city or army, and that the necessity of the thing, according to the vulgar adage, is itself a law.

4. If the thigh bone be broken into many pieces, and with large splinters driven through the skin, if the knee joint be shattered and torn, if the tibia and fibula be terribly fractured, as by a ball, or a loaded carriage passing over it, and that along with that compound fracture, with crushed bones, detached splinters, and the skin and muscles macerated in a proportioned degree, there also be lacerations of the tibial and fibular arteries, the limb cannot be saved. And although the foot may be saved when a ball has passed through the heel bone, or has passed quite through the tarsus (although it have splintered all the bones,) yet when the ball sticks in the tarsus, it is a very dangerous wound (often followed by locked jaw or gangrene) in which it is difficult to save the foot; but when both the ankle joint is laid open, and the tarsus also is much lacerated and disordered, it is almost impossible to save the foot, it had better be cut off.

5. In this fourth rule I have mentioned chiefly the dangerous wounds of the lower extremity; and the reason of my doing this falls now to be explained; for it is really in wounds of the lower extremity, chiefly, that we are reduced to the hard necessity of cutting off the limb. The lower extremity is larger, forming a great proportion of the whole body, whence a high fever and greater pain ensue; and in its wounds there are larger arteries to bleed, greater bones to be reunited or restored, and larger masses of muscle and skin, to fall into inflammation; but the chief danger is the confinement in wounds of the lower extremities, with consequent loss of health. The uniform posture exhausts the spirits, and the profuse discharges exhaust the strength; and few have strength to go through all the hardships of a nine months cure. Whereas, in wounds of the upper extre-  
mities,

mities, the proportion of the wound to the whole system is small, the fever slight; the case is in all respects more manageable; a man wounded in the arm can be carried with little comparative suffering from a field of battle, and he is not confined for months to a loathsome hospital; the moment that his fever is gone, he is able to rise, he recovers his health, and he preserves it during the whole cure.

We struggle long and patiently to preserve the hand, for it is by his hands that the poor man earns his bread; but, in a great wound of the leg, we ought not always, by a long confinement, to risk his loss to society, or to those who are depending upon him; and, when he is forced to lose his leg, he, still having his hands to work with, continues a useful citizen, though, no doubt, he will be useless as a soldier; and this very distinction constitutes, I believe, the chief distinction betwixt the practice of the English and of the Prussian surgeon, whose decision on this point has been, if I am not greatly mistaken, settled by some higher authority than that of a jury of army surgeons.

6. Amputation should, in those cases where the limb is plainly and irrecoverably disordered, be performed on the spot.

When the operation has been delayed, either by the inconveniencies of your situation, the tardiness of consultants, or by the real accidents and difficulties of the case; in short, wherever the pain or swelling, fever, or convulsion, have come on, there you must refrain from present operation, and must try to save the limb. But again, after the patient, having escaped the first dangers of gangrene, has lain for six weeks, or two months, under profuse suppurations or exfoliating bones; if, while you are trying to support him with bark and wine, but with very poor hopes of accomplishing a cure, he should plainly be sinking under the hectic fever, then again amputation may be proposed; but it is, on one hand, very distressing to throw away all hope, and lose the advantages which our patient  
has



has struggled for through so much suffering and danger ;—while, on the other hand, his life, which was at first in danger from pain and gangrene, is now a second time in danger from colliquative suppurations and a hectic, which wastes his strength ;—but this very weakness, which has brought him into this condition, is so far favourable to the success of the operation, that it may be fairly questioned, whether this second period be not fitter for amputation than the first.

7. With regard to the operation itself, I may venture to affirm, that the ill success of the French and Prussian surgeons proceeded from operations, either done under inauspicious circumstances, or in themselves ill-performed ; and that, by a prudent choice in point of time, and neatness in the manner of performing the operation—a particular care in securing the arteries, and every endeavour to keep your patient clean and warm in an easy condition, and in general health, you will be successful, not indeed in the proportions of private practice, but in proportion to your means and opportunities ; and more than this, no man of good sense can look for.

8. To conclude ; you must never amputate during fever, pain, convulsion, great swellings of the limbs, but most especially, during that high-coloured inflammation which betokens approaching gangrene ; there the disease is in the constitution ; by cutting off the limb, you do not cut off the disease :—The gangrene, in two days, shows itself upon the stump, or the convulsions, which cease, perhaps, for a moment, return along with those startings which follow amputation ; and then follow a bending back of the body, locked jaw, and a very cruel death. This is the reason of our performing amputation, either on the instant ; viz. before these terrible symptoms have begun, or later ; and, after they have ceased, this is the foundation of Le Dran's axiom, “ That where there is plainly a necessity for losing a limb, the sooner it is done the better.”—And my intention in this reasoning, and these

these remarks, is to establish this rule in your minds above all the seduction of wonderful cases, which, though surely true, are yet mere exceptions, which it were better for you not to know, than trust to too much.

From the specimens above presented, the reader will readily perceive, that the striking character of these discourses, is promptness of decision and clearness of description. We think it a work admirably calculated to impress students with the fundamental principles of the science of surgery, and to enable them to detect abundance of errors, which are to be found in systems written by authors who have related much more than they have seen, or indeed than has ever really existed.

**ART. LXVII.** *A new Method of operating for the Femoral Hernia: Translated from the Spanish of DON ANTONIO GIMBERNAT, Surgeon to the King of Spain. To which are added, with Plates, by the Translator, Queries respecting a safer Method of performing Inoculation; and the Treatment of certain Fevers.* — Octavo, 70 pages, price 2s. 6d. — Johnson, London, 1795.

**T**HE improvement in the performance of the operation for the femoral hernia, suggested in this pamphlet, is grounded on a more accurate acquaintance with the structure of the parts immediately concerned. In the usual mode of dividing the Fallopian ligament, much danger is incurred of wounding either the spermatic or epigastric artery; and this danger, Mr. Gimbernat professes to avoid altogether by the mode of operating which he has here recommended. To make this understood, it will be necessary to follow the author in his description of the crural arch.

In the lower part of the abdomen, the external oblique muscle forms a strong and broad aponeurosis.

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The fibres are parallel; they descend obliquely from without inwards; and the lower extend from the superior anterior spine of the ilium, to the os pubis, at a little distance from which they open into two bands, or pillars, to form the inguinal ring. In all this tract, the aponeurosis forms a duplicature inwards. This duplicature, which is more manifest towards the os pubis, constitutes a strong whitish cord, which Fallopius supposed to be a ligament; and so it was called, till of late, when it received the name of crural arch, because at the top of the thigh, it has some distant resemblance to an arch or vault. The aponeurotic duplicature in its inside forms a canal, which is larger towards the os pubis, and lodges the spermatic vessels. These vessels run for a certain space through the canal, before they traverse the inguinal ring, where the canal terminates.

Between the ilium and os pubis, the arch is kept sufficiently tense by an expansion of the fascia lata, which unites intimately with it in its whole length, in such a manner, that if the expansion be cut, the arch is considerably relaxed. In the natural state, the tendons of the psoas and iliac muscles pass beneath it, as also the great crural vessels, and the lymphatic coming from the lower extremity. In the diseased state, some of the parts contained in the abdomen also pass, and form a tumour at the lower part of the groin. This is what is called a crural hernia.

This arch offers to our consideration some peculiar contrivances, little or not at all understood, though the knowledge be absolutely necessary to a perfect idea of the crural hernia, and to the safe operation for its cure. When the inferior band separates from the superior, to form the inguinal ring, it goes to insert itself in a tubercle of the os pubis, which has been denominated its spine, and which gives origin to the crest of the superior branch of this bone, and is a continuation of the linea ileo-pectinea; moreover this pillar is not only inserted into the spine by a considerable union of aponeu-



rotical fibres, but the duplicature of the arch being much greater there, it is continued inwards along the crest of the pubis, by means of a remarkable plait or duplicature, consisting of a portion of the aponeurosis. The particular disposition of this duplicature, extending from below upwards, and its insertion from the spine to the end of the crest, which makes more than an inch in some subjects, is highly worthy of our consideration; for without it, we should all probably suffer large and dangerous protrusions of the contents of the abdomen. In consequence of this structure, the crural arch has two edges; one external, rounded like a cord, thicker towards the pubis, and resembling a ligament, as Fallopius actually denominated it; to this adheres the expansion of the fascia lata: in emaciated persons, the direction and tension of this cord may be felt through the integuments. The other edge, which I have called internal, is the termination of the edge of the aponeurosis; it is very thin, and from its origin unites ultimately with the aponeurosis, that covers the iliac muscle. This strict union, and that of the fascia lata with the external edge, are most perceptible from the anterior superior spine of the ilium to the neighbourhood of the crural vessels; hence the crural arch is more flattened and down in all this course on the iliac muscle, serving it as a band to keep it in its place during its contractions; consequently it is impossible that a crural hernia can ever take place in this tract, as some have supposed.

As soon as this intertexture of aponeurosis reaches the great secondary external iliac artery, there is detached from the internal edge of the crural arch a membranous expansion (which is strengthened by the tendon of the small psoas muscle, when this muscle exists,) and insinuates itself behind the great secondary external iliac artery and vein. This expansion goes to be inserted close to the external edge of the pectineus muscle: moreover, one lamina from it passes over that muscle, and is attached to the crest of the branch of the os pubis, where it is united with the duplicature of the arch which terminates in the same crest. By this union



is formed a species of ligament which passes along the crest, below which the superior extremity of the pectineus muscle is inserted.

• From this division of the crural arch there arises an aponeurotic sheath at the top of the thigh; it begins at the crural arch itself, close to the os pubis; so that the expansion, which has been described as sent from the internal edge of the arch, and passing behind the iliac vessels, forms the posterior part of the sheath, while the anterior is formed by the external edge of the fascia lata.

• The iliac vessels, enveloped in the cellular substance of the peritonæum, enter into this sheath in their passage out of the abdomen; there are likewise some glands and lymphatics in it; but the crural nerve always passes without the sheath towards its external and posterior part.

• The iliac artery and vein, before they enter into the sheath, send off the epigastric vessels by its anterior part: these vessels pass obliquely inwards, between the crural arch and spermatic vessels, which they appear to embrace on their entrance into the canal of the arch. From the external lateral parts of the iliac vessels, after their entrance into the sheath, are sent off the small inferior iliac branches, which take their course towards the spine of the ilium, close to the insertion of the oblique internal and transverse muscles, in the bottom of the duplicature of the crural arch.

• In the internal lateral parts of the sheath close to the branch of the os pubis, precisely where the insertion of the duplicature of the arch ends, and on the inside of the great secondary iliac vein, there is left a foramen sufficiently distinct, almost round, at which many lymphatic vessels enter. A lymphatic gland is sometimes fitted into this foramen, and the parts which form the crural hernia always pass through it, consequently we may properly call it the *crural ring*. A single gland placed in this ring would prevent the issue of the parts contained in the abdomen; but if a portion



of the intestine should slide behind, so as to get out of the cavity, it would be very difficult to distinguish the hernia at first. A surgeon not acquainted with the structure would be much embarrassed if he were to attempt the operation.

• The great iliac vessels occupy the principal portion of the orifice of the sheath; the spermatic vessels close a little of the external side before they enter the canal of the arch. The epigastric vessels, in their way to the musculus rectus, cover it sufficiently in its anterior and internal part. Lastly, some aponeurotic fibres turn in from the internal edge of the arch; and a few lymphatic glands assist in stopping it completely, so that it is very difficult for the parts contained in the abdomen to make their way out, except through the crural ring.

• If the particular structure of the crural arch and its tension, as kept up by the expansion of the fascia lata, be considered, we shall clearly see the reason why the crural seldom obtains so great a bulk as the inguinal hernia. We shall likewise see why the tumor is regularly round, hard, and slippery; a circumstance that causes much hesitation and even mistakes in practitioners of small experience. We shall also perceive why the operation is more dangerous, and reduction without operation more difficult. This difficulty has laid practitioners of the greatest credit under the necessity of performing an operation which they dreaded, because they did not know how to steer, besides the dangers that threatened the patient's life.'

• *Method of operating.* The patient being placed as for the operation of the inguinal hernia, and the hernial sac being properly laid open, an attempt should be made, if the intestine be uninjured, to replace it by the hand. For this purpose a little more of the intestine should be drawn out, because sometimes the incarcerated portion is so strongly contracted as not to allow passage to the matter contained in the part beyond. This is frequently the only impediment to reduction: it is generally to be overcome by bringing to the ring, if possible, a por-  
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tion of the intestine that has remained in the abdomen. This not having suffered strangulation, will not be contracted like that which has suffered it for hours and days.

‘ If the reduction cannot be effected in this way, it is absolutely necessary to divide the part that occasions the strangulations. For this purpose introduce, along the internal side of the intestine, a canulated or grooved sound, with a blunt end and a channel of sufficient depth. This is to be directed obliquely inwards, till it enter the crural ring, which will be known by the increased resistance; as also when its point rests upon the branch of the os pubis. Then suspend the introduction; and keeping the sound (with your left hand, if you are operating on the right side, and v. v.) firmly resting upon the branch of the os pubis, so that its back shall be turned towards the intestine and its canal to the symphysis pubis, introduce gently with your other hand into the groove of the sound a bistoury with a narrow blade and blunt end, till it enter the ring: its entry will be known, as before, by a little increase of resistance. Cautiously press the bistoury to the end of the canal: and employing your two hands at once, carry both instruments close along the branch to the body of the pubis, drawing them out at the same time. By this easy operation you will divide the internal edge of the crural arch at its extremity, and within four or five lines of its duplicature; the remainder continuing firmly attached by the inferior band or pillar, of which it is the continuation. This simple incision being thus made without the smallest danger, the internal border of the arch, which forms the strangulation, will be considerably relaxed, and the parts will be reduced with the greatest ease.

‘ By this new method, the operation for the crural hernia, which the most celebrated surgeons have justly accounted extremely dangerous, is rendered the most simple and safe of all that are practised in cases of strangulated hernia.

‘ The Fallopiian ligament is not at all concerned in this operation ; neither can the spermatic cord or spermatic artery, much less the epigastric, be divided, for all these parts are left at the shoulders of the sound, and far remote from the edge of the bistoury. The same may be said of the obturatrix artery, when it arises from the great secondary external iliac, though it passes over the branch of the pubis in its way to the foramen obturator. If by chance any of its small branches extend to the duplicature, they are so very minute that they carry with them no danger. I may say the same of another small anomalous artery, that occasionally ramifies through this part, since capillary vessels are never obstacles to operations of surgery.

The danger most to be dreaded, is that of wounding the urinary bladder, which would certainly be exposed, if it were full at the time of operation ; but it cannot possibly be wounded if empty. The precaution, therefore, of making the patient evacuate his urine a little before the operation, which was observed by Garangeot in such cases, must by no means be neglected.

‘ In pregnancy of four months and upwards, the uterus may also be wounded. To avoid this injury, a bistoury, blunt at the end, is to be employed, like that which Arnaud used in the bubonocèle. Besides, we must take care not to introduce it far, and to have the patient greatly inclined to the opposite side.’

The author has practised this method successfully in two cases ; and two others have been communicated to him by Professor Torner, of Barcelona. At the end of the work are added two plates, explanatory of the structure of the crural arch.’

Dr. George Fordyce a short time since\* had suggested an opinion, that in inoculation for the small-pox, the less matter is applied, the more mild will be the disease. From this it occurred to Dr. Beddoes, to whom we are indebted

\* Vide Transactions of a Society for the Improvement of medical and chirurgical Knowledge.



indebted for the translation of the above work, that if it were advantageous to introduce a small quantity of variolous matter at the time of inoculation, this might be done by diluting the matter with water. This idea, Dr. Beddoes communicated to his medical friends, two of whom he found had actually adopted the practice; the result of which is here given.

Mr. Wayte, of Calne, in Wiltshire, in answer to the particular heads of inquiry, made by Dr. Beddoes, observes, that the dilution was by an equal quantity, or sometimes more, of water—at least eight hundred were inoculated from this, one of which only died, a child of five months. As to the comparative mildness, he observes, that the patients went through the disease without any irregular or dangerous symptoms; not more than five or six out of the whole number had full crops, and these were distinct.

Mr. Rolph, surgeon, at Thornbury, in Gloucestershire, gives a similar testimony.

To insure the application of a small quantity of diluted matter, and also to insure a superficial wound, Dr. Beddoes advises, first, to apply a blister of an extremely small size, not more than a very small fraction of an inch in diameter, over the insertion of the deltoid muscle. After the scarf skin has risen, and all pain has subsided, open the vesication, and let out the liquid. — Secondly, mix some variolous matter with ten or twenty times its bulk of water; dip the point of a camel's hair pencil into the diluted matter, and touch the exposed skin as lightly as you can.

On the subject of fever, Dr. Beddoes remarks, that the concurrent testimony of Drs. Clarke, Wade, Rush, Chisholm, and Mr. Boag, is in favour of the use of quicksilver in certain cases of this disease. Hence, Dr. Beddoes supposes, that this mineral would probably be of essential utility in many fevers common in this country; and its effects are thus accounted for. Since, in fevers the system continually passes from a state of  
torpor

torpor to a state of excitement, may not the increased action of the salivary glands tend to keep the whole body in a more equable state, and prevent the formation of fever fits? Salivation is stated to be essential to the cure. Will salivation prevent the return of the fits of intermittents?

ART. LXVIII. *Medical Extracts.* Vols. I. and II. price 6s. each.

(CONTINUED FROM PAGE 498.)

THE present volumes contain an inquiry into the nature of health, and the laws of the fibrous and nervous systems.

*Section 1.* On Stimuli.—2. *Law 1.* A due Excitement is necessary for the maintenance of Health and Vigour.—3. Of extreme Heat.—4. Of moderate Heat and extreme Cold.—5. On Light.—6. On Air.—7. On Exercise.—8. On Food.—9. Of the Gastric Solvent, and the relative digestibility of Food.—10. Practical Observations.—11. Of the Vital or Oxygen Air entering into the composition of our Body.—12. Of the Cloathing of Infants.—13. Of the Cloathing of Adults.—14. Of Vision.—15. Of Hearing.—16. Of the Touch.—17. Of Pain.—18. Of the sensation of Heat and Cold.—19. Of Smelling.—20. Of Taste.—21. Of Imagination.—22. On Anger.—23. On Enthusiasm.—24. Of Love.—25. Of Social Affection.—26. Of Virtue.—27. Of Hope.—28. Of Fear.—29. Of Habit.—35. *Law 2.* A too great excitement of any Organ exhausts the excitability of the Contractile Fibre.—36. Of Oxygen as the principle of Irritability.—37. *Law 3.* A defective stimulation of any Organ accumulates Irritability in the moving Fibres.—38. Of Cold.—39. The manner in which Colds and Inflammatory Fevers are produced.—40. Of Darknes.—41. Of Sleep.—42.

Some



Some practical Observations.—43. Of Impure Air.—44. Of Rest.—45. Of Hunger.—46. On Asphyxia from Cold.

From the above statement our readers will form an idea of the general nature of the work. Its professed object is to diffuse a knowledge of the general principles of medicine among mankind, and to enlighten them on the subject of the animal œconomy. Physicians often lament, it is observed, that their patients will not pursue the directions given them; and indeed, when their sense is not persuaded, it is no wonder they are tempted to follow their own fancies. From possessing a general knowledge of the laws of the animal œconomy in health and in disease, they will be enabled to distinguish the practitioner of modest merit from the quack, who wades in darkness, and tries his specific remedies one after another, until the patient recovers more by accident, and the efforts of nature, than by the effects of his art. Knowledge and improvement become daily more widely diffused. Men of science begin to exercise their judgment on one of the most important subjects to man; and when this comes generally to be the case, abstruse and unintelligible doctrines will be exploded, and the tyranny of empty pomp and learned mystery in medicine will be driven to seek shelter among less cultivated societies.

With respect to the propriety of diffusing medical knowledge, we have but one opinion. It would be beneficial to both the patient, and the deserving practitioner; to the former infinitely so. Philosophic instructions (says Dr. Adair) on the important subject of health, delivered in a familiar way, cannot injure in the least medical men who have the high advantage of experience together with education; for no sober man of common sense will trust the salvation of his soul to a cobbler, nor employ a taylor to defend his property in Westminster-Hall. I am therefore fully persuaded (says he) that when the thinking part of the nation are taught what has hitherto been called the mystery of the profession, men  
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in general will feel it their duty to support the regular faculty, and will be weaned from being quacked by miscreants who are as little qualified to practice physick, as a cobbler is to preach, or a taylor to plead a cause, or a mender of kettles to repair (an instrument of far less complicated structure than the human body) your watch.

This work, as its title imports, consists almost entirely of extracts from the various authors who have lately written on the new chemistry, and its application to medicine, in a word, the aërial practitioners. Like them, too, the compiler carries his opinions farther than, we fear, strict philosophy would warrant. But time is the only regulator in these matters. It will probably be long before these opinions will receive their just appreciation.

ART. LXIX. BRIEFE AUF EINER REISE DURCH FRANKREICH, ENGLAND, HOLLAND, UND ITALIEN, &c. *Letters written upon a Journey through France, England, Holland, and Italy, in the years 1787 and 1788.* By J. C. G. SCHEAFER, M. D. 2 vols. 8vo. Regensburg.

**T**HE greater part of these letters contains principally observations on the prevailing practice of medicine in the different countries and cities which the author has visited. The following are the principal objects detailed on the subject of medicine.

Letter II. Paris. General Remarks on the bad regulation of the poor-houses and hospitals of that capital; on the manners, the character, and the social life of the Parisians, &c.—Letter III. Physical lectures by Charles, Sage, and other naturalists.—The author found these literary characters, upon the whole, more affable and obliging towards strangers than the greater part of physicians and surgeons in Paris.—The Lyceum, and other learned societies—school for surgeons—remarks on the surgical operations and lectures of the celebrated Default —accounts



—accounts of some famous surgeons and physicians, namely Baudelocque, Sabatier, Peyrithe, Carrere, Portal, Barthes, Vicq d'Azyr—of some operations—of their latest works, and anatomical preparations. Medical society—German physicians in Paris—Quackery in medical practice—Veterinary school at Charenton—the very remarkable cabinet of animal preparations, the property of President Chabert. Letter IV. On the external as well as internal regulations of the infirmaries in Paris, and their, in many respects, wretched situation, is peculiarly interesting and instructive. Letter V. Journey to London—general remarks on the first appearance of that metropolis; on its inhabitants, manners, and articles of diet.—The British Museum, and other remarkable collections of natural and artificial curiosities—medical police, practice, and the usual treatment of sporadic diseases in London. (The author's account of the London infirmaries, and other philanthropic institutions, is equally just and curious) Medical societies, and their principal members—the most celebrated English physicians and surgeons. Letters VI. VII. and VIII. contain short descriptions of different excursions made to some maritime and inland counties of England, together with accounts of their respective infirmaries. Letter IX. On the great anatomical theatre of the late John Hunter. Letters X. to XIII. contain a journey through Flanders to Holland; also some good remarks, particularly on the late anatomists Lyonet and Camper at the Hague. Letter XIV. Infirmaries at Lille, Rheims, Dijon, and Lyons.—The subsequent letters are more or less interesting, and contain short accounts of the hospitals in the Italian States. The principal and best-regulated infirmaries are at Milan and Modena, which, in point of cleanliness, surpass even the English. Upon the whole, our author observes, with respect to the Italian hospitals, that they would be the first in Europe, if the medical, surgical, and dietetical regulations were equal to the good order, neatness, and attendance established in them.—The last letters, written from Rome, abound more with topographica

topographical than medical observations ; yet we find some accounts of the hospital of St. Spirito : and in truth, the establishments for the diseased in Rome scarcely deserve any notice ; for they are, like all its other regulations of police, in the highest degree wretched, and completely analogous to the miserable papal government.

*Vide Concise Review of German Books.*

ART. LXX. VERSUCH EINER ALLEGEMEINEN MEDICINISCH-PRAKTISCHEN GEOGRAPHIE, &c. i. e. *An Attempt at an universal medico-practical Geography; exhibiting the History of the Practice of Medicine, public and domestic, among the different Nations of the Earth.* By LEONARD LUDWIG FINKE, M. D. and Prof. at Lingen. Vol. I. *Containing the Countries situated between 45° of North and South Latitude and the Equator.* Vol. II. *Between 45° and 80° N. and S.*

PROFESSOR FINKE here presents his countrymen with a work unique in its kind. It is surprising that nobody before him ever attempted to make a general collection of the more important medical facts from all known countries of the globe, and to bring these materials into one distinct work ; a work which could scarcely fail to prove universally useful and instructive.

The author modestly calls his performance no more than “ an attempt at an universal medico-practical geography ;” he disclaims all pretensions to perfection, and frankly says : “ I did not aim at producing a complete system ; but I hope I have furnished materials for a future one.” For this very reason he deserves no small share of approbation, together with our warmest thanks ; as we have no doubt, that both pathology and therapeutics will be much benefitted by the present work, and that many valuable additions may be made  
by



by such materials for the improvement of each of them.

Conformably to the plan of the author, the countries treated of in this work are divided into certain latitudes ; he has frequently taken an extent of ten degrees together ; for most of the considerable empires of Europe are found to occupy in general each a space of ten degrees of latitude, if we make the necessary allowance for small variations in so general a division. This appeared to the author an important circumstance ; partly as a people subjected to the same form of government commonly agree pretty nearly in their language, religion, manners, and customs ; partly as the climate, food, and diseases do not very materially differ, where those other circumstances agree.

We find, in every instance, the authorities quoted, upon which the author rests his information ; he has also provided this instructive work with a complete index, which he has divided into five alphabetical registers, containing, 1. The names of authors and other persons quoted in this work ; 2. A geographical index of the names of countries, seas, mountains, rivers, cities, nations, wines, and mineral waters, mentioned in both volumes ; 3. A nosological register, exhibiting the names of endemic and other diseases which either very frequently, or very rarely appear in each respective country or place ; as likewise some particular causes of diseases treated of in the present work ; 4. The names of medical remedies, the methods of cure, the articles of food and drink which contain a peculiar quality ; and 5. The names of winds prevailing in the different countries. The utility of such registers in a work of this kind is very obvious.

(IBID.

ART. LXXI. VERSUCH EINER GESCHICHTE DES ADER-  
 LASSENS. *An Attempt towards an History of Phlebotomy.*  
 By F. X. MEZLER, M. D. 8vo. 293 p.—Wolken.

THE author of the history before us enters first upon an examination of the different theories of those medical writers who have been too great advocates for blood-letting ; and, after having stated his opinion upon this subject, he inquires into the origin of this remedy, as likewise into the well or ill-founded opinions concerning it, as held forth at different periods ; and lastly, he investigates the sources from which the modern abuse of it may be derived, and in what manner physicians have expressed their opinions respecting phlebotomy in their various systems. The whole work is divided into five sections or epochs, beginning from one remarkable physician, and proceeding to another, who maintained, on this subject, doctrines differing from those of his predecessor. The time, when venesection was first employed, is not accurately known : the first section, therefore, comprehends the space from this however uncertain period to the time of Galen ; the second comprises the history of it from the time of Galen to Helmont ; the third, to Stahl ; the fourth to Bordeu ; and the fifth to Wolfstein, the present veterinarian professor at Vienna. In each of these five periods the practitioners in physic professed very different opinions respecting this remedy and its application : some of them trifled with it ; others shed the blood of man in a wanton and extravagant manner ; others again limited the use of it too much, and even held it in detestation. This history of phlebotomy deserves to be carefully perused by every medical man ; for the perspicuous statement of the injuries arising from both extremes in practice, cannot fail to prove interesting and instructive. The style of the author is animated ; in some places rather too much so, especially where he is misled by a lively, and sometimes fanciful, imagination.

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ART. LXXII. GEMEINUTZIGE AUFATZE ZUR BEFÖRDERUNG DER GESUNDHEIT, DES WOHLSEYNS, UND VERNUNFTIGER MEDICINISCHER AUFKLÄRUNG. *Essays upon Subjects of general Concern, for the Improvement of Health, Prosperity, and a rational Illumination of Mind in Matters of Medicine.* By C. W. HUFELAND, Prof. of Med. at Jena. Vol. I. pp. xii. and 236. 8vo. 1794. Leipzig. Göschen.

**D**R. Hufeland, who has already presented his countrymen with several popular publications upon interesting subjects of medicine, (particularly a late publication, on the essential advantages of inoculation, &c.) proposes in the present work, to direct their attention to the internal progress of the passions and powers of the mind, as far as they may influence health.

The essays in question are well calculated for this useful purpose; and may serve, at the same time, as excellent patterns of medical treatises for readers who are not of the profession. It may be said with truth of this performance, that it vindicates, as far as can be expected, the scientific character of medicine in the eyes of those who regard that character; for it is plain and intelligible to every reader who is accustomed to comprehend connected ideas in any branch of science, and it contains a variety of information, even for the physician, while it obliges him to read with attention. Besides these intrinsic advantages, the author's manner of writing is equally perspicuous and attractive.

Contents: "The character and magnetismus of Mesmer.—A new project for extirpating the small-pox.—Some cosmetics, but not from Paris.—Some ideas on the latest and most fashionable quack-medicines. On the means for improving more universally the beauty of man, in the easiest and most certain manner.—Necessary cautions respecting baths; and on the necessity of their re-establishment in Germany.—On the remarkable motions of the *heydyssarum gyrans*; and the effects of electricity upon it, with a copper-plate; to

which is added a translation of an essay by Saussure, on some new species of *tremellæ*, possessed of a peculiar motion." Lastly, "On the dangers of imagination."—A treatise written with elegance and acuteness; it exhibits many striking facts in a comprehensive view, and we hope the author will present us in the continuation of this work with an analysis, how the tendency to such dangers may be discovered, and in what manner they may be prevented and cured. (IBID.

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ART. LXXIII. ALLGEMEINE HEILKOLOGIE; ODER NOSOLOGISCH - THERAPEUTISCHE DARSTELLUNG DER GESCHWÜRE, &c. *A general Helkology; or a nosologico-therapeutical View of Ulcers, adapted for the Use of Students.* By A. G. WEBER, M. D. and Prof. at Rostock. 8vo. xvi. and 268 pp. Berlin. Frank.

THE work before us consists of two sections: the first from page 1 to 90, contains the physiological premises for exhibiting a nosological view of ulcers; and the second, from p. 91 to 268, an attempt towards a classification of ulcers, arranged with regard to the critical efforts of nature.—That the author has diligently perused the works of his predecessors on the subject of which he treats, and that he has deliberately considered the materials here digested, every medical reader will readily allow. A man endowed, like this writer, with peculiar talents for pathological enquiries, might contribute much towards clearing up this branch of medical science, and thus enlarge our views in one of the most important departments of human knowledge, if he would communicate to us the further result of his original inquiries into matters of pathology; a wish we cannot suppress, while we recommend the present work to the careful perusal of the physician as well as the surgeon. (IBID.

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ART. LXXIV. SEMIOTIC; ODER HANDBUCH DER ALLGEMEINEN ZEICHENLEHRE, &c. *Semeiotica; or manual of the general Doctrine of Symptoms; for the Use of young Surgeons.* By F. G. DANZ, M. D. and Prof. at Giessen. 8vo. viii. 376 p. Leipzig.

NOT only young surgeons, but physicians also will find in this book the *general doctrine of symptoms* excellently treated, and the whole interspersed with many valuable practical remarks. The author died lately in the prime of life, and his death is much lamented by every true friend of science; as he intended to publish likewise a *particular view of semeiotics*, a task for the execution of which he was eminently qualified. The present manual justly deserves to be recommended to every medical man; and if we except Gruner's original work on this subject, we know of no other performance which is equal in merit to that before us. The author has arranged the subjects under discussion in a very perspicuous order, and his propositions are so clearly stated, that he who does not comprehend them, is not entitled to practise medicine. (IBID.

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ART. LXXV. ANTRITTSREDE BEY ANKUNDIGUNG DER KLINISCHEN VORLESUNGEN. *Preliminary Discourse on entering upon a Course of Clinical Lectures.* By A. F. MARKUS, Aulic Counsellor and Physician to the Prince-bishop of Bamberg. 8vo. 1793. Bamberg, printed for the Benefit of the Establishment for diseased Journeymen and Servants.

A Discourse drawn up with attractive simplicity, in which the author describes the regulations adopted in that truly humane asylum for the diseased, lately established by one of the wisest princes of Germany.\*—

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\* Francis Lewis, bishop of Bamberg and Wirzburg, Prince of the Holy Roman Empire, &c. who died in Feb. 1795.

We fully agree with the German Reviewers, that we are unacquainted with any institution of the kind, from which the cause of humanity, as well as our science, may expect greater benefits. Experiments are made with medical remedies, regardless of any expence; minute cases are drawn up of every patient; the dead bodies are dissected; pathological preparations, however expensive, are carefully preserved; even incurable patients are admitted, if their cases be singular and instructive; surgical pupils are allowed to assist at operations; in the clinical lectures the prevailing diseases among the lower animals are introduced; in the apothecary's shop, an expert chemist lectures on the *materia medica*, and the latest discoveries in chemistry and physics; the physicians permit their pupils to see and attend with them their patients in town; treatises upon individual cases are drawn up by the students, and afterwards printed, if approved of by the physicians, &c. The number of patients within the house generally amounts to fifty: in epidemic diseases double that number may be accommodated. The proportion of surgical cases to the others is nearly as one to three. Since the foundation of this infirmary, from Nov. 1789 to the end of 1793, 1842 patients have been admitted. Upon an average there died only one out of nineteen. The journals of the house afford materials for a periodical publication, several numbers of which are published every year. After having given the outlines of this noble seminary of medical education, we cannot forbear mentioning a fact, which, more than any panegyric, confirms its excellence, and the reputation it has so justly acquired: "respectable citizens and their wives repair to it, when labouring under disease, in preference to staying in their own homes!!"



ART. LXXVI. UEBER DIE NATUR UND DEN GEBRAUCH DER BADER. *On the Nature and Use of Baths.* By H. M. MARCARD, *Physician to the Duke of Oldenburg.* 8vo. xviii. and 456 pp. 1793. Hanover. Hahn.

THE author's late publication, *On the Properties of Pyrmont Water*, is a work so generally known and so highly valued, that every physician in Germany considers it as a classical performance; for it contains, beside the useful investigation of mineral waters, the most satisfactory account of nervous diseases, and such maladies as originate from obstructions in the abdominal viscera. This new work too exhibits convincing proofs that a physician, who is appointed by public authority, to attend patients visiting a bath, cannot act consistently with his duties, unless he gives an impartial account of the effects of bathing *in general*; (although he be treating of a *particular* water) and unless he furnishes his readers with such observations as are, in every respect, founded upon plain truth and actual experience, unmixed with prejudice and self-interest. All these requisites we find combined in the author, in a very eminent degree. His performance throughout is free from partial views, so that at every bathing-place, where there are not some peculiar powers ascribed to the waters, his book may be safely used as a guide for our general conduct in bathing. The prevailing idea of warm and cold baths, the author has adjusted in every point of view, and has thus furnished us with the most instructive explanations upon these important remedies.

For a more particular account of this interesting publication, we refer our readers to the *Analytical Review* for Nov. 1794, p. 331; or to the *British Critic* for Dec. 1794, p. 693. (IBID.)

ART. LXXVII. MEDICINISCHE FASTENPREDIGTEN, &c. *Medical Sermons on Abstinence: or Dietetical Lectures with respect to the Body and Mind; for Improvement of Manners in the degenerated State of Wedlock; for the Preservation of Health in that State, and the patriotic Education of Youth in Germany.* By F. A. MAY, *First Physician to the Electress Palatine of Bavaria.*—Part II. 8vo. 376 pp. 1794. Mannheim. Schwan and Goetz.

THE first part of these lectures, which appeared some years ago, we find rather unfavourably reviewed in the General Literary Gazette of Jena; yet the same reviewers allow, with respect to this second part, “ that the author has delivered these discourses with more calmness, dignity, and prudence; that he makes many useful, and some original observations, frequently expressed with great energy; though his work is not altogether free of partial views and extravagant declamation.”

Contents: Lecture 1. Of unhappy marriages; 2. Of human instinct for propagation, of its use and abuse in married life; 3. On the dissipation of youth, &c. 4. Of the duties and necessary co-operation of the head of a family in the education of his sons for the common good of their native country. 5. For wives and mothers, on physical and moral happiness in wedlock; on the obstacles against, and the means of attaining that felicity. 6. Of the bodily and mental accomplishments of daughters on the eve of maturity, &c. 7. Of the duties and casualties during pregnancy. 8. Of the (probable) causes of accidents in parturition and child-bed. 9. In what manner a prudent mother ought to explain to her new-married daughter the duties incumbent on her in that state;—how a father should perform this office to his son, and a clergyman to the young married couple.



ART. LXXVIII. *The Evidence of the superior Efficacy of the Cinchona Flava, or Yellow Peruvian Bark; an Essay in which the correspondent preparations of the three Peruvian Barks most generally known are compared, and in which the yellow is proved to excel the pale and the red, by that Evidence which is proper to Materia Medica.* By WALTER VAUGHAN, M. D. 8vo. 66 pages. Price 1s. 6d. Cox, London. 1795.

THE first section of this essay treats of the history of the yellow bark; the second on its sensible qualities;—they are chiefly extracted from former writers. The third section treats of the medical effects of the three Peruvian barks, particularly of the yellow. We shall quote what the author advances on this head, as the most original part of the work.

‘The early writers on *Materia Medica* (he observes) attributed the medical effects of the pale Peruvian bark to its astringent, stimulant, tonick, and antiseptick powers; and succeeding writers on it, and on the red, attribute all their good effects, and all their bad, to the same powers. But the reasoning that I have seen concerning them, seems to be confused and unsatisfactory; and I am inclined to believe, that physicians have not yet acquired just notions of the effects or operation of the substances, in which they imagine these powers to be inherent. I shall illustrate my opinion by considering what right the Peruvian barks have to the title of astringents, stimulants, tonicks, and antisepticks.

‘As *astringents*.—Astringent medicines are defined such as contract and condense the soft solids, by uniting to those solids. I cannot conceive, that there are any such medicines. They who conceive there are, reasoning by analogy, argue from the known effect of an infusion of oak bark on a dead hide, to the same or a similar but unknown effect of it on the living solids of animals. Now, as their opinion of the latter effect must arise entirely from their view of the former, a comparison of the two will plainly show my reason for



refusing to admit a class of medicines with the epithet astringent.

‘ If a piece of dead skin be soaked in an infusion of oak bark, or of Peruvian bark, an union of some part of the infusion to some part of the skin is obvious enough. The colour and the consistence of the skin are changed; and though the skin be afterwards soaked and washed in distilled water, yet it will not part with what it attracted from the infusion. The skin is then called leather; and the operation by which it is converted into leather, is called tanning. Every man knows that if a piece of such leather be washed with a solution of vitriolated iron, it immediately turns black. But if the hand of a living man be ever so long soaked in a tan-pit, no such effects ensue. Its colour is not changed, neither is the consistence of the skin changed. And there is no chemical attraction between any part of the infusion and the cuticle or skin of the hand; for if it be well washed with water, it is not afterwards rendered black by iron in any of its soluble forms.

‘ Therefore, analogical evidence, which is at best but a feeble support, does not in this part of medicine deserve even the name of a proof. Nay, the subject admits evidence of another kind; and there is the fullest assurance that the greatest errors in practice have arisen from conclusions drawn from the effect of substances on dead matter to the same effect of those substances on living matter. Let us consider the other evidence.

‘ First. Medicines called astringent do not cause the fibres of a living animal to contract; for if you soak one hand in a decoction of galls, and then pass it into a glass cylinder, the other hand soaked in fair water being at the same time passed into another cylinder, both hands will manifest a similar degree of perspiration; which they could not, if the astringent principle of the decoction constricted the orifices of the perspiring vessels. Again, if the decoction rendered the skin denser than before, to bathe in a tan-pit would be far more rational



tional in some disorders of weakness than to bathe in cold water.

‘ Secondly. Medicines called astringent do not stop a hemorrhage from the smallest arteries. And the strongest astringents applied to the tongue, occasion a flow of saliva.

‘ Thirdly. Taken internally, they do not seem to stop hemorrhages, or even serous discharges from the surface of the intestines. I have given them a long time, without producing any such effect; and the harm they often do, evidently arises from their too stimulant operation.

‘ The notion of astringents communicating their effect beyond the part to which they are applied, is curious and extravagant; and though broached by the celebrated Cullen, is unsupported by either facts or experience. These are his words: “ I must say, that in practice I have been as much disappointed in these cases (cases of serous flux) as in the case of hemorrhage; and upon the same ground, that the effects of astringents taken into the stomach are not propagated so powerfully to distant parts as to produce the constriction required in them. This I have had occasion to remark with regard to the leucorrhœa, or fluor albus. For the cure of this disease, I find forty remedies recommended by writers on *Materia Medica*; but I have met with forty cases of it, in which not one of those remedies was of any service.” Certainly there is not even the semblance of a proof of the effect of an astringent being communicated from the part to which the astringent is applied. And the acute Dr. Heberden, whose success with internal astringents had been like Dr. Cullen’s, says, “ I do not lay any great stress upon the use of internal astringent remedies, because it does not appear likely from reasoning, that they should do any service; and I am far from being convinced by experience, that they ever do, except perhaps in hæmorrhages of the *primæ viæ*. They may sometimes have appeared to be attended with success, because there is but a very small proportion

proportion of hæmorrhages, not owing to external violence, which would prove fatal though no means were used to stop them; and hence it has happened, that a great number of other external and internal medicines have been very undeservedly advanced to the rank of specifics in this complaint."

• If an unmedical reader now turns his attention to that effect which has so frequently been attributed to the Peruvian barks, particularly to the red, which is the more astringent to the taste; I mean the effect of diminishing natural and healthy secretions, and of inducing costiveness; he will naturally ask, though not with the same reason as Doctor Heberden, "Is there any foundation for believing the bark to be so powerful an astringent as to obstruct any natural and critical evacuation, and thereby endanger the health; or to make us fear giving it upon these accounts, whenever there is any other good reason for its being given?" However, this very question, asked by so excellent a physician, puts the matter out of all question.

• I have already hinted, that Peruvian bark applied to the tongue, causes an increased secretion of saliva; and there is reason to believe, that applied to the stomach and intestines, it causes an increased secretion of the gastrick and enterick liquors. But be this as it may, it is improper to infer a bad effect of any medicine from only its astringency, or from any other quality. Besides, experience proves, that the best Peruvian bark, especially when first given, often purges violently. Sydenham, who knew this, and who added laudanum to the bark, to prevent a violent purging following it, has yet asserted that there is no purgative quality in it, but that the effect arises from a peculiar idiosyncrasy in the constitution. Doubtless, Sydenham recollected its astringency, and would not acknowledge that an astringent could purge! yet his experience taught him better.

• There are two cases in which the bark may be supposed to occasion costiveness: the one is, when the  
bowels



bowels are very weak ; the other is, when the bark is not good. In the former, I believe, the costiveness depends entirely on the state of the bowels, so that bark cannot purge them till it has strengthened them ; in the latter, though the bowels be strong, yet the bark, having no virtue, hurts just as any other inert matter, acting mechanically, would, if swallowed in such a form, and in such a quantity.

‘ Now the yellow Peruvian bark purges more than the pale or the red : and it must be remarked, it purges more easily. It excites no gripes, like the red bark. And as a less quantity of it is sufficient, it creates no nausea or sensation of weight at the stomach. Some, who prefer the yellow bark, attribute its not griping to its being less astringent than the other two : but having not attended to the effect of the pure astringent principle of vegetables on the living body, I have no opinion to propose on this subject.

‘ As the yellow bark is not so astringent as the red, it is plain that its superior febrifuge virtue does not depend on its astringency. And indeed there are other medicines in the class of astringents, which, though more astringent to the taste than Peruvian bark, yet do not soon stop the recurrence of the paroxysms of fever. Besides, it may be that the principle of astringency is so enveloped and concealed in the Peruvian bark, as not to be detected by the taste, though the febrifuge virtue of it depend on a combination of the astringent principle with the principle of bitterness, and perhaps with some other principles not yet detected. For example ; Peruvian bark, digested in spirit of wine, till it loses all astringent taste, will serve for a decoction that is rendered turbid by vitriolated iron.

‘ As *stimulants*. The Peruvian barks were never recommended as mere stimulants. They are very weak stimulants, and give rather strength than quickness to the pulse. The strongest stimulants are not supposed to have any febrifuge virtue, and certainly do not of necessity give strength.

‘ As

‘ *As tonics.* Astringents and tonics are generally supposed to be the only means of communicating tension, tone, and strength. But as the former do not act in the same manner on living flesh as on dead ; it is probable, that they act as tonics, and are such in every respect. This appears the more probable, as though all astringents are tonics, yet all tonics are not astringents.

‘ How tonics act on the nerves and moving fibres, to produce tone and strength, is not known. We must rest satisfied with the fact. Dr. Cullen teaches, that tonics give tone to the stomach, and that it is communicated from thence to the whole body by the nerves ; but this is improbable. If want of appetite and indigestion ever depend upon a diminution of tone in the vessels that secrete the gastrick liquor, it must be very rarely : for those most liable to indigestion are the melancholic, whom every physician, from Galen to Cullen, has distinguished by the density of their solids, and their superior strength.

‘ I can easily suppose, that want of appetite and indigestion depend primarily on a too small quantity of gastrick liquor, or on a diminution of its solvent power. But as a small quantity is enough for those who eat but little, and as a weak menstruum is powerful enough for things of easy digestion, there is reason to conclude, that the remote cause of indigestion is swallowing more solid food than the gastrick liquor is able to dissolve. In proof of this, I would mention that the dyspeptic are generally those who have eaten voraciously ; particularly old people, who likewise neglecting proper exercise, have led a life of indolence.

‘ If more food be taken than can be dissolved, the superfluous part will ferment, and the stomach will be distended with flatus, and weakened. When the quantity of gastrick liquor is increased, the fermentative process is prevented, good chyle is formed, and from it good blood.



‘ Tonics then seem to me to act primarily on the nerves of the stomach, increasing the secretion of the gastrick liquor, and causing a quick solution and extraction of the nutrient part of the food. Hence not only good chyle, and good blood, but a restoration of strength; which must also be the more rapid, in proportion as the gastrick liquor regains its former activity.

‘ Dr. Cullen allows no medicines to be tonic, except bitters: but, I think astringents, which act on the nerves, should be called tonics, and classed with them. However this may be, if medicines be more tonic in proportion as they are more bitter, the yellow bark must be a stronger tonic than the pale bark or the red; and experience proves it to be so. Indeed, whoever considers for what purposes bitters are at any time successfully employed, cannot entertain a doubt but that the yellow bark surpasses not only the other cinchonæ, but also serpentaria, gentian, colombo, and even quassia, of which so much has been said.

‘ As *antiseptics*. The Peruvian barks have long since been celebrated as antiseptics by those who hold that putrefaction takes place in the circulating blood, and that there are diseases which deserve the name of *putrid*. But, if it had never been a received opinion, that medicines act in the same manner upon dead bodies as upon living, it is highly probable, that the epithet *putrid* would never have been employed to express the nature of any disease. And, if this epithet had never been employed, it is morally certain, that we should not have talked, as we do now, about antiseptics. The rhetoric of medicine has been little cultivated: and the maxim, *Medicamentum non agit in cadaver*, has been repeated, but not understood; or, what is worse, not regarded.

‘ In the first place, it does not appear, that there are putrid diseases. In the second place, it does not appear, that there are antiseptic medicines.

‘ Dr.

‘ Dr. Cullen enumerates as signs of putrescency,  
 “ 1. With respect to the stomach, a loathing of animal food, nausea and vomiting, great thirst, and a desire of acids. 2. With respect to the fluids, the blood drawn out of the veins not coagulating as usual; hemorrhage from different parts, without marks of increased impetus; effusions under the skin or cuticle, forming petechiæ, maculæ, and vibices; effusions of a yellow serum under the cuticle. 3. With respect to the state of the excretions, fetid breath, frequent loose and fetid stools, high-coloured fetid urine, and foetor and livor of blistered places. 4. The cadaverous state of the whole body.”

‘ Now, as Dr. Milman observes, to say that putrescency, or a mere tendency of the fluids to putrefaction, can produce the true signs of absolute putrefaction, is to confound all propriety of language. The signs enumerated by Dr. Cullen signify only a debility or laxity of the solids: for there is no certain proof of a putrid incoagulable blood flowing from the veins of the most scorbutic patient. And scorbutic blood has as little taste as any that Dr. Lind tried, and does not corrupt sooner.

‘ Antiseptics. It does not appear from the observations of practitioners, that the medicines most extolled for their antiseptic power, are the best to cure the diseases called putrid. The Peruvian barks are said to be antiseptic, because an infusion or a decoction of them may be preserved a long time without mouldiness or decomposition; and because a piece of meat immersed in them may be kept sweet a long time. The red bark, from experiments of this sort, is said to be more antiseptic than the pale, and the yellow than the red.

‘ I have already said so much, to prove that arguments, founded on a remote analogy, are not to be admitted in medicine, that I shall add no more at present. I shall only quote Dr. Cullen’s opinion concerning the effect of Peruvian bark, because it is in fact my  
 own



own opinion:—"This bark is well known to practitioners to be highly useful in all cases of febrile putrefaction, when it is employed in sufficient quantity. Whether however, its effects are to be ascribed to its tonic, or to peculiar antiseptic powers, I cannot certainly determine; but I am disposed to think the former opinion the better founded." Any man who thought at all, must have thought so. I confess, I was astonished at the thought, after having perused almost the whole chapter *Antiseptica*. But alas! the truth will often escape from persons in spite of their prepossessions, and will often render them inconsistent.'

With respect to the comparative powers of the yellow bark, the author remarks, that it possesses the power of restoring appetite and strength, and of suspending the paroxysms of fevers, in a greater degree than the pale or the red; that it is a medicine which was much wanted; not only because it is more tonic, more purgative, and more febrifuge, than the pale or the red, but also because these three virtues seem to be in such proportion one to another, as to render it a safe remedy in some cases of local excitement and inflammation; that it increases the perspiration, apparently without accelerating the motion of the heart and arteries. The pale bark and the red stimulate more, and sometimes cause a disagreeable heat in the skin; lastly, that the preparations of the yellow bark are more likely to be always of the same efficacy, than those of the pale bark, or the red.

Section 4th. On the preparation of the yellow bark.

Section 5th. On the superior safety and excellence of the yellow bark in the cure of particular diseases. The very sanguine opinion entertained by the author of this bark, will be seen in the following quotation:—"It appears, therefore, that there are very few diseases, in which at some period, the tonic effects of the yellow bark, joined to its diaphoretic and purgative, are not likely to be equally beneficial to the patient, and to the reputation of medicine."—Its superior qualities he attributes

butes to its possessing more bitterness, and to its greater purgative power.

On the effects of bark in fever Dr. Vaughan thus speaks. ‘ Considering all fevers as essentially the same, from their agreeing in the essential symptoms, in consisting of distinct paroxysms, in changing one into another, in generating and communicating an infectious matter capable of exciting the same form of disease, and in yielding to the same remedy, I have here given a general title. As to the idiopathick inflammatory fever, I, like Doctor Clark, have never seen such a fever, neither can I conceive that such a fever can exist.

‘ The pale Peruvian bark has long been esteemed a remedy for intermittents; but as a remedy for continued fevers, it has been acknowledged but by very few. Indeed, Sydenham had given it in tertians and quartans degenerated into continued fevers; and had said, that it was more necessary as the fever was more continued. And it might have been inferred, that the bark was equally efficacious in all fevers not symptomatic, from the above-mentioned circumstances in which all fevers agree. But practitioners maintaining perverse notions of humours, and tenaciously preserving the distinctions of fevers made by the ancients, would not give bark in continued fevers, or remittents, till the patients were almost dead, or, as they themselves thought, almost putrid. We are particularly indebted to Pringle, Huxham, De Haen, Clark, and a few others, for the evidence of the utility of the Peruvian bark in the fevers called continued.

‘ A question now naturally offers itself, At what time of fevers is the bark to be given to the greatest advantage? This question involves three others.

‘ The First. Should it be given as soon as a person that has been exposed to infection feels that languor and restlessness which generally occur a day or two before a regular paroxysm is formed? Or, perhaps in more familiar terms, Will the bark prevent a fever after the infection has been received, or will it only  
put



put off it's occurrence? If we reason by analogy, we shall conclude, that it will not prevent a fever, when the disposition to it is acquired, but that it will postpone it's occurrence, or perhaps render the impending paroxysm more regular. And if the bark does this, it is certainly right to give it, as soon as it is known that a patient has been exposed to the infection, unless contraindicated by very particular symptoms. If the infection have not been caught, the bark may render the body impregnable. And if it have been caught, and the disposition be expected to change into disease, it is an object worthy of attention to make that disease regular in its recurrence, and easy of cure. All physicians seem to agree in this; and there is the greatest reason to believe that fevers in hot climates might totally be robbed of their malignancy, if the bark were given largely before the actual formation of them.

‘ The Second. Should the bark be administered as soon as a paroxysm is formed? I presume, none at this day will say it should not. It is true, Sydenham and Boerhaave said so; but experience has long since prevailed over their authority in this particular. Nay, Sydenham approves the early exhibition of the bark in intermittents, if the patients complain of much weakness; if the paroxysms anticipate in their periods, or increase in their duration; or if there be petechiæ, maculæ, or vibices.

‘ If the bark will cure a fever, and that it will, we cannot doubt, the reason for not giving it till “*morbis jam aliquo tempore duraverit*,” is very hard to be conceived. There seems to me to be no reason at all. And I am certain, that to wait till a few paroxysms are over, or till the disease is supposed to be at its height, is the same as to leave the patient to his fate.

‘ The third question. Should the bark be administered in the remissions only, or in the exacerbations also? An opinion once prevailed, that the bark given in the hot fit or exacerbation, or before a few returns of the fever, increased the constriction on the surface,



and checked the natural and healthy secretions. But this opinion was not founded in experience. And, as debility lays the foundation of fever, any pretext for deferring the exhibition of the bark should be laid aside. Dr. Cullen says, very reasonably, "Though I would not rigidly assert that the bark can never be safely given during the exacerbation or hot stage of fevers; yet I maintain, with the most part of practitioners, that the time of remission is especially to be chosen; and accordingly as that time is known to be longer or shorter, the doses of bark are to be as large as the patient's stomach will easily bear, so that a due quantity may be thrown in during the time of remission." But according to my experience, there is the greatest truth and importance in these words of Doctor Clark: "As soon as the intestinal canal has been thoroughly cleansed, the cure must entirely depend upon giving the Peruvian bark in as large doses as the patient's stomach will bear, without paying any regard to the remissions and exacerbations of fever. If the remissions be distinct, the bark indeed will have a more speedy effect in subduing the fever; but even if it become continual, by a regular and steady perseverance in the medicine, it will be prevented from growing dangerous and malignant."

These questions being considered, I shall speak of the supposed necessity of evacuations to render the bark safe; a necessity much inculcated by Pringle, Van Swieten, and others, though not acknowledged by many eminent physicians of the present day. These profess a rational conviction that previous evacuations do not render a cure by the bark more easy, more safe, or more certain; and that to delay the exhibition of the bark till after the operation of a vomit, a purge, or a sweat, especially when there are remissions, is not only useless, but even dangerous. But I will not suppress, that in vernal fevers, which are seldom accompanied with symptoms of malignity, I have found evacuations, even venesection, to remove a state of the system which seemed to oppose the successful operation of the red bark.



bark. Whether any state of the system can impede the the operation of the yellow bark, I am uncertain; the fevers which I have seen were an easy conquest to it.

‘ Sickness and vomiting occurring before the disease is actually come on, prevent the bark from being retained. My practice is, in imitation of Sydenham, to cure the sickness before I prescribe the bark. With this view, I give either warm water or chamomile tea, and afterwards a dose of opium. If the sickness and vomiting do not cease by consequence of these means, I order saline draughts in the act of effervescence, purging clysters, or a blister to the epigastrium.

‘ If great pain of the stomach accompany nausea and vomiting, I give æther vitriolicus, or opium, and try to produce an evacuation downwards, with calomel. If a congestion in the brain, or in any other viscus attend, I order venesection and purgatives. But if I take the sickness to be a mere symptom of the fever, I prescribe the bark, and find it more efficient than any thing else.

‘ Some have entertained a belief of I know not what obstructions in the viscera; and have thought any of the barks of Peru improper till these were overcome. But to delay the exhibition of the bark upon such grounds, is, in my opinion, ridiculous; because, as to yellowness of the skin or the tunica conjunctiva, or tumours of the abdomen, all which depend upon the duration of the fever and the frequent returns of it, the Peruvian bark is the sole preventative and cure of them. I speak this upon the authority of Cleghorn, Millar, Monro, Lind, and others of great experience.

‘ Those who have practised in hot climates, seem persuaded that calomel possesses a specifick power over the febrile diseases which prevail there. They imagine that calomel, as a mercurial, not a purgative, opposes the principle of those diseases; and so prevents and cures the affections of the liver which so frequently accompany or follow them. The fact is established; and whether the explanation of it be admitted or not, is of no moment. However, as calomel and every



other mercurial medicine excites great action, and by consequence, great weakness; the bark seems very strongly indicated, at the same time, to keep up the power of the system, and to prevent the patient from falling a sacrifice to excessive action. On these grounds, I would give calomel and the yellow bark together.

‘ It is observed by Dr. Saunders, in his excellent treatise on the red bark, that “ There are many symptoms which would forbid the use of the bark, did they occur distinct and independent of intermittent fever; such as cough, difficulty of breathing, and pain in the side. They are frequently brought on by the paroxysm of the intermittent, and give way to the bark, by which alone that paroxysm may be prevented. Such symptoms do not admit a distinct and separate treatment, but are always aggravated by the use of evacuants, more especially of bleeding, the most probable means of relief in common depuratory fevers.”

‘ Agues are often in disguise; but it is the duty of a medical man to distinguish them in every form. It is impossible to lay down rules for doing this. However, an attention to the prevailing epidemick, the season, and the climate, will greatly assist the judgment. Morton, who is full of useful facts, has written a whole chapter on the proteiform genius of intermittent fever; and to him I refer the reader who desires information on this subject.

‘ As intermittents when cured are very liable to return, it is proposed to continue the bark afterwards, in order to remove the febrile disposition. Morton and Sydenham treat of this at some length, and the writers of materia medica have transcribed their opinions. Therefore, if neither Sydenham nor Morton be at hand, the reader may turn to the article Kina in Geoffroy, or Cinchona in Bergius, &c. But the propensity to a relapse is different in different situations and in different subjects; so that a resident practitioner will often be able to foretell a relapse, if he know that any cause has been applied likely to excite it; and to prevent it, if he do not know that



that any such cause has been applied, by an attention to the days on which the paroxysms were used to return.

‘ I have dwelled the more on this subject, because the bark is mostly employed for the cure of fevers. Before I proceed, I would remind the reader, that the yellow bark is twice as efficacious as the pale, that it is more bitter, more deobstruent, more purgative; and by consequence a safer remedy for fevers.’

The work concludes with the testimony of several respectable practitioners in favour of this remedy.

ART. LXXIX. *A Treatise on the Scurvy; containing a new, easy, and effectual Method of curing that Disease; the Cause and Indications of Cure, deduced from Practice; and Observations connected with the Subject; with an Appendix; consisting of five Letters, respecting the Success of a new antiscorbutic Medicine.* By D. PATERSON, Surgeon in the Royal Navy.—8vo. 87 pages. Price 2s. 6d.—Edinburgh. MANNERS and Co. 1795.

THE author of the treatise before us gives the following account of the opportunities he has had of observing and treating the scurvy. ‘ In the years 1779, 80, 81, 82, 83, and 84, on the coasts of America and Africa, and in the East Indies, I had opportunities of making observations on the diseases incident to seamen. In the year 1793, I was appointed to his Majesty’s ship Resolution; in which, the following year, having the honour to accompany Vice Admiral George Murray to America, and still being very anxious to ascertain many points relative to the scurvy, as well as some other diseases, I renewed my observations and experiments.’

‘ In the passage to America, which was tedious, the scurvy soon making its appearance, I was, from reasons which will afterwards appear, induced to try a solution



of nitre in common vinegar, in several cases of the disease; and, with inexpressible pleasure, I saw it succeed. I say inexpressible pleasure, because the opinions I had long entertained, not however without my doubts, were now grown into facts; because I was satisfied that the scurvy might be cured, at sea, without the assistance of recent vegetable matter, a discovery which I conceived might turn out to be a national advantage.

‘ On the 7th of December 1794, after having experienced the extraordinary effect of a solution of nitre in common vinegar in restoring above eighty seamen from the scurvy, I presented the result of my practice, in a long letter, to Admiral Murray, with what then appeared, and still appears to me to be the cause of the disease, and such observations as, at that time, seemed necessary for the good of the public service.

‘ The letter alluded to, with additions, in which is included the appendix, consisting of five letters respecting the effect of a solution of nitre in common vinegar, in removing the scurvy, constitutes the present performance, which will, I hope, be found beneficial not only to the navy, but to the army, whether in camps, garrisons, or ships. The remedy has been fully tried; and experience, and various phenomena, pointed out the cause which is assigned.’

The author considers Scurvy as the produce of contaminated, poisonous, or foul air, rendered so by azotic and hydrogen gasses, acting more readily in proportion as the body is exposed to, or affected by, the operation of other sedative causes, singly, or combined. This, he thinks, may be inferred from the following considerations. Scurvy is never found but in such situations as have been already mentioned; or in close damp places, such as garrisons, prisons, &c. frequently are; and it has been found in such places even when there has not been any want of vegetable diet. All such places, according to circumstances, are filled, more or less, with foul air; and, according to the present state of our knowledge of chemistry, of late much encreased by the combined labour



hour of different philosophers, both at home, and abroad, it is highly probable, that such foul air is chiefly azotic, or hydrogen air. By experiments, these airs are known to be, from their sedative powers, highly noxious, and incapable of supporting animal life; hence, under certain circumstances, they are, it may be presumed, capable of producing disease. It is also known, that these airs have the property of changing blood from a florid to a dark colour; and, in a combined state, they are, it is believed, of an alkaline nature.

The symptoms of scurvy, depression of spirits, debility, chilliness, nausea, anorexia, constipation, with, at times, a frequent, small, or, at other times, a slow, not preternaturally full, pulse, &c. are evidently the effects of sedative powers. Likewise, the blood, in this disease, is of a very dark colour; and the urine, from its smell, and from its effect on vegetable, is of an highly alkaline nature.

The scurvy, with the assistance of a mild, nourishing diet, has been removed, in favourable situations, by a sufficient supply of pure atmospheric air, or by medicines containing oxygen or vital air, which are known to be of a cordial, stimulating, renovating nature, and have the property of changing blood from a dark to a florid colour. The urine, likewise, as people emerge from this disease, loses its volatile disagreeable smell, and its power of changing vegetable blue to green.

Therefore, as scurvy appears in such places as have been mentioned, and as such places are supposed to abound with azotic and hydrogen gasses; as these gasses have sedative powers, and the property of changing blood from a florid to a dark colour, and are, when combined, of an alkaline nature; as sedative effects appear as soon as any in scurvy; as the blood is of a dark colour, and the urine of an alkaline nature; as the scurvy is mitigated, or removed by pure atmospheric or oxygenated air, which is of a cordial, renovating quality; as oxygen gas contains, what is diametrically opposite to alkali, the acidifying principle, and has the property of chang-



ing blood from a dark to a florid colour ; and, finally, as highly oxygenated vegetable acids are more powerful than any thing else in mitigating or removing all the symptoms which constitute or attend this disease, he ventures to conclude that the inspiration of a vitiated atmosphere is the source of the disease.

As far back as the year 1784 the author gave nitre to a considerable extent in the scurvy, and, as he thought, with advantage. He supposes that its good effects in mitigating, or removing the disease, are to be accounted for, solely, from the dephlogisticated, or vital air, it contains; and that it may be rendered more active by being combined with an acid. Although common vinegar was allowed by the author to be of little or no utility, when given by itself, yet the author supposed, that if it were charged with dephlogisticated or oxygen air, it might prove highly beneficial; and this he supposes to be effected by the addition of nitre. The following is the method of preparing and administering this new remedy.

‘ At first I dissolved two ounces of nitre in one quart of the ship’s vinegar, and gave half an ounce of the solution, which I have named acetum nitrosum, or nitrous vinegar, to some twice, to others thrice in the day, and as frequently bathed their blotched and ulcerated limbs with the same. From the good effect it had, and from its not producing the smallest degree of nausea, colica, or diarrhoea, I was induced to augment the dose to an ounce, and to repeat it as often as before.

Finding by far the greater number of scorbutics, who were under my charge, bore the increased dose of the medicine, without experiencing the least uneasiness, I now, instead of two, dissolved four ounces of nitre in one quart of vinegar, and gave from half an ounce to two ounces of this strong solution twice, thrice, or four times in the day, according to circumstances; and, also bathed the legs with it frequently in the course of the day, if they were either blotched, stiff, or ulcerated. In this manner I continue to use it.

Some



‘ Some patients cannot bear the nitrous vinegar without the addition of water; while others, without the least inconveniency, bear it undiluted.

‘ The discharge by stool, the absence or the presence of gripes and nausea, guide me with respect to increasing, or diminishing the dose of the nitrous vinegar; but at the same time, it is not a slight degree of either nausea, or colica, or diarrhœa, that renders an alteration in the quantity of the medicine necessary. To a great number of scorbutic patients, eight ounces of this strong solution, containing one ounce of nitre, have, in the course of the day, as long as such a quantity was necessary, been administered to each with the greatest success. Also, a circumstance no less curious than pleasing, large and frequently repeated doses of this medicine have been given in cases of dysentery scorbutica; and, instead of increasing, I have always found it remove the disease. Sometimes, notwithstanding the free use of the nitrous vinegar, I have known constipation take place to a considerable degree; in which case, I have found intermediate doses of crem. tart. necessary, and highly advantageous. This very constipated state generally occurred where the disease was far advanced. But, in a few particular cases, in delicate habits, and where the disease was not far advanced, I have found even small doses of the nitrous vinegar ruffle the stomach and the intestines; to prevent, or remove which, I have found two, three, or four grains of camphor, with each dose of the medicine, very effectual.

‘ In cases of the scurvy, during a course of the nitrous vinegar, the belly, in general, is kept gently lax, the discharge of urine is increased, and changes from an alkaline to a healthy nature; the skin becomes open, and more agreeable to the touch; the chilliness is changed to a pleasing warmth; and the pulse acquires steadiness and healthy strength. Sleep comes to be more and more natural. The fallow and the gloomy, is gradually changed into a clear and cheerful, countenance.

By



By degrees, the inflammation of the mouth and nose subsides; the gums heal and get firm. The lower extremities lose, faster than could be supposed, their livid hue; they gradually become softer, less painful, and more flexible; and ulcers put on an healthy appearance, and skin over. The great oppression about the breast and stomach gives way; and the cough, and the breathing become less laborious. The appetite and the sense of taste are restored. The depression of spirits, and the lassitude are not remembered. The strength increases; and, at last, health is re-established.

From the time I joined his Majesty's ship Resolution, about the beginning of October 1793, to the middle of July 1795, when, on account of indisposition, I was under the disagreeable necessity of resigning, about one hundred and eighty scorbutics came under my care; and, although a great number of them were extremely bad cases, yet all of them, excepting one man, of a weakly constitution, who died, from the disease violently affecting his lungs, and three others who were sent to hospitals, one to Haslar, and two to Halifax hospital, recovered on board, and chiefly at sea, under many disadvantages, without feeling any inconveniency from the want of lemons, limes, or any kind of recent vegetable matter. The two men sent to Halifax hospital were not so ill as others who were, at the same time, kept on board; but, notwithstanding the uncomfortable situation of the latter, from the refitting of the ship, and fresh beef only three times a week, they were restored before the former; I suppose from the effect of the nitrous vinegar.

In the month of July 1794, at sea, a small quantity of limes were purchased, by order of Admiral Murray, for the use of the scorbutics, at that time on board: but, instead of depending altogether on their power, I put a certain number only on them, on purpose to compare their effect with that of the nitrous vinegar, which was more generally administered; and, from what I have seen of both, and after having duly weighed all circumstances,

I am,



I am, at present, inclined to decide in favour of the latter. From July 1794, neither recent nor preserved fruits were administered to scorbutic patients, on board of the *Resolution*.

The author, although a friend to cleanliness on board ship, yet dissuades, and, we think, with much propriety, against the frequent washing between decks, which is commonly practised. By this, a constant dampness is produced, than which, nothing, probably, is more pernicious.

From experiments on the blood and urine of scorbutic patients, it appears, that three ounces of blood, on cooling, consisted of two ounces of coagulum and one of serum. The coagulum consisted of two parts; that on the top, about a sixteenth of an inch, was of a florid red, and tough; that in the bottom, of a deep red, approaching to black, and easily divided. The serum, with respect to colour was not uncommon. Vinegar did not alter the colour of the black part of the coagulum. By the addition of lemon juice it became somewhat lighter; on the admixture of a solution of nitre in vinegar, it became of a florid red; the same took place with nitre and lemon juice. By volatile alkali, and diluted vitriolic acid, the coagulum was turned black, and was again rendered florid by the addition of nitre in the juice of lemons, and in vinegar.

The urine of scorbutic patients turned the blue vegetable infusions of a green colour. The urine of those recovering from scurvy loses the power of changing vegetable blues to green.

Testimonies in favour of what the author calls the nitrous vinegar are by Mr. R. H. Beaumont, Mr. Robert Fairfowl, and Mr. Joseph Fleming, surgeons in the navy.

ART. LXXX. *Considerations on the medicinal Use and production of Factitious Airs.* By THOS. BEDDOES, M. D. and JAS. WATT, *Engineer*, Part III. 122 pages, price 3s. Johnson, London, 1795.

THE present publication of Dr. Beddoes contains an account of the medicinal effects of factitious airs from various respectable authorities, exemplified in individual cases. All we can do is to select a few of the most striking.

*Letter from Dr. REDFEARN.*

*Lynn, Norfolk, 26th June, 1795.*

SIR,

I SEND you the case of Hæmoptysis which I mentioned in my last letter: you will no doubt think it an important one.

I am, Sir, your most obedient Servant.

RICHARD REDFEARN.

*To Dr. Beddoes.*

Mr. B. F. Æt. 23, of a florid complexion, narrow chest, prominent shoulders, smooth skin, and of a delicate slender form, has been afflicted with hæmoptysis about two years and a half; attended with dyspnœa, cough, a disagreeable sense of burning in the chest, and expectoration of a purulent nature. P. about 100, and invariably accelerated by the hdc. air—Hætic fever was not completely formed; but he had at times a sense of chilliness in the day time with heat towards the evening. He began by taking one quart of hydro-carbonate, diluted with twenty-one quarts of atmospheric air, once a day. From this mixture he experienced much vertigo during its inhalation, and, two hours after dinner, he suddenly became vertiginous, from which, however he soon recovered, although a violent head-ache remained during the rest of the evening.

The following days he only inhaled one pint of hydro-carbonate, mixed with twenty quarts of common air,  
once



once a day, which generally affected him with some slight vertigo and tightness over his forehead; the hydro-carbonate was increased gradually to two quarts or more at one dose, but I find it always necessary to begin with the original dose, where the air has been recently generated.

My patient has been persevering in this plan three months: and has had no return of hæmorrhage; his cough and expectoration are very much diminished; sometimes he does not expectorate more than one table spoonful in the space of three days; he has also never experienced any of the distressing heats in his chest which harassed him before the administration of the air; his dyspnœa is perfectly removed, he can ride upon horse-back twelve miles without feeling much fatigue; his appetite is very good and he sleeps well: P. 80, he says he thinks his health is perfectly established.

*Extracts of letters from DR. ALDERSON, respecting a case of Chlorosis, a case of Pulmonic Disease, and a cheap Apparatus for the production of elastic fluids.*

Hull, May 29, 1795.

DEAR SIR,

I HAVE had under my care a case of apparently approaching phthisis; the complexion was uncommonly florid; the patient has perfectly recovered from the long-continued use of hydrogen air.

A case of chlorosis has also occurred to me in which steel proved ineffectual without oxygen. The patient never could sleep without her dose of this air, of which she inhaled a quart every night. So great were the beating of the carotids, the anxiety and the sense of drowning, when she was about to lie down, that she was under the necessity of sitting up all night, nothing ever procuring rest, till the oxygen was administered. Then the beatings ceased. She lay down and rested. She continued

tinued the air some months. It was assisted by small doses of steel, which she had in vain tried under every formula before. She has ever since been healthy and blooming.

I use the simplest contrivance possible for every kind of air. I will send you a drawing of it, if you think it will be of any service.

I am your's most sincerely,

J. ALDERSON.

*Extract of a Letter from DR. THORNTON,  
On a Case of Venereal Affection.*

May 3, 1795.

THE practitioner now and then meets with peculiar habits, in which mercury seems to have no action:— and again, other cases in which mercury is immediately carried off by ptyalism, violent sweats, or excessive diarrhœa. In both these states I was desirous to see the vital air tried, but as yet have been able only to observe its salutary effects in the latter instance.

A wealthy merchant of the city of London, after inebriation, became the victim of indiscreet indulgence. Mercury was had recourse to in the form of pills and unguent, but these produced the greatest derangement in his health, and affected almost instantly the salivary glands. The primary symptoms being however subdued, his surgeon, an able and experienced practitioner, thought fit to leave off the mercury, seeing it was so inimical to his constitution; and for some time the patient believed himself safe; but this Proteus disease broke out in another form, and that unfortunately at the time when he had just married. He was salivated again, but could not retain, according to the opinion of Bell, sufficient mercury to establish a cure; or rather the mercurial action was at first too violent and local  
to



to be kept up a sufficient time to produce a permanent benefit. Hence this cruel disorder afflicted him for more than the space of two years. When I saw him, the surface of his body was deformed by dreadful blotches; he had an ulcer on the lungs, attended with a hard cough, and bloody and purulent expectoration; with other horrid marks of this dreadful scourge of illicit desires. Messrs. Wathen and Phipps, seeing this gentleman in so deplorable a state, and having witnessed the relief, arising from the aerial practice, in the case of a servant maid, whom (though not a servant of their family) they humanely lodged in their house, and who was in the last stage of a pulmonary consumption; advised him by all means both to consult me and Mr. Hill.

From my former residence at the Hotwells, near Bristol, and from frequent conversation with the late Dr. Rigg, physician of that place, I was convinced of the fatality of consumption from venereal ulcers; and though this case was not exactly the one I had chalked out in my mind for the first trial of the vital air, yet, as perhaps it afforded the only chance of recovery, I urged its use. Mr. Hill accordingly gave him each day the super-oxygenated air, in the proportion of two quarts to a thousand cubic inches of atmospheric air; and by way of medicine, he had muriated mercury in the strongest decoction of bark, with the cortex, and two grains of opium at night. He was also occasionally purged. By this course, without any violent effect from the mercury, he was in three weeks clear of all defæcations of the skin, and in a month the ulcer on the lungs was healed, and the other marks of venereal affection disappeared, and in six weeks he went to Margate, deeming himself perfectly cured.

A question here naturally arises, whether the cure in this case proceeded from a different administration of mercury, or from the combined operation of super-oxygenated air? These doubts must often occur to a private practitioner, before the acquisition of more facts.

I cannot

I cannot conclude this letter without congratulating you on the discovery, that the kali sulphuratum stops the action of mercury on the system; in a few hours arresting salivation.

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*Extract of a Letter from MRS. BARRETT.*

*July 12, Queen-Square, Westminster.*

SIR,

MY asthma had afflicted me three years. It attacked me very violently at times, the fit going off generally with expectoration, leaving me very low and weak.—The last winter it was uncommonly severe, and latterly, for months, I had not known what it was to enjoy a comfortable night's rest. As a tradesman in our neighbourhood had been just cured by medicated air of an asthma of thirteen year's standing, I resolved to put myself under Dr. Thornton's care, though before this, I had made up my mind to try no more medicines. I inhaled the vital air from a large bell glass, and its effect was so immediate, that on the second night I slept the whole night through. My attacks were now less frequent, and milder, and pursuing the vital air for six weeks, I got free of my complaint. With the blessing of God, I have continued since in perfect health, except I catch a bad cold, when my asthma recurs, but in a very slight degree.

I am, Sir,

Your obedient humble servant,

ELIZ. BARRETT.

*To Dr. Beddoes.*



*Letter from Mr. DANBY to Dr. BEDDOES.*

*Upper John-street, July 19, 1795.*

SIR,

I HAD the honour of receiving your letter, in which you request my case, and an account of the effects that the vital air had on me. I have accordingly drawn up the narrative which I enclose.

I went the latter end of July, 1794, in tolerable health to ——. Not designing to stay there long, I took up my abode at an inn in the town. As was my custom at these places, I ordered port wine after dinner and supper; I observed the wine had a peculiar sweet and soft flavour, which was very unusual and agreeable, but I by no means drank of it to excess. On the third day after my arrival I was seized with tremors, and having taken up a pen to write out some music, to my great alarm, I found I could not accomplish it. The friend who was with me, complained at the same time of a most violent bowel complaint, with great griping and copious evacuations. I was soon after seized with spasms, and lost the use of both hands and feet. I proceeded on to Lymington, and having consulted a physician there, was ordered bark and sea bathing. I went then to the Isle of Wight, and attempted to bathe once, and immediately perceived a great increase of my disease. I therefore hastened back to town, and as soon as Dr. Rowley heard that I was in a most deplorable state, with that humanity so conspicuous in his disposition and character, he voluntarily came to offer me his services, and with the greatest kindness visited me both in town and country. But notwithstanding those remedies, which I have not the smallest doubt were the most promising of the pharmacopœia, yet my disorder kept on advancing, and as I had been taking drugs for five months without benefit, I grew very anxious to make trial of the vital air, which had been of the greatest service to some of my friends. But I did not choose to enter into any new

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scheme, without first consulting my friend Dr. Rowley ; who, so far from objecting to it, wished me by all means to make trial of the vital air. I waited therefore upon Dr. Thornton. It was the beginning of December. My hands were pendulous, so that I was obliged to be fed, dressed, and undressed, like a child ; being quite helpless, having no use of my limbs, I was also obliged to be carried from place to place ; my countenance, as well as I can express it, was of a black yellow ; my appetite gone ; and my nights truly dreadful. Counting the hours as they passed, I repeatedly prayed for morning, which was no sooner come, than I hurried from my place, as I called it, of torment. You will scarce credit the assertion. A week had not passed from the time of my first inhaling the vital air, before my appetite returned, and my nights were rendered so comfortable and refreshing, that my wife could scarce get me up at a reasonable hour in the morning—bed was become such an indulgence. My spirits, as you might expect, were very great ; my appetite the same ; and my family observed that my countenance was considerably mended. Before the month was out, the motion of my hands was so far restored, that I could compose catches and glees, and in six weeks I began to employ my crutches. My general health is at the present time fully established, and Dr. Rowley says, “ I ail nothing now but weakness, the consequence of previous indisposition.”

I have the honour to be, Sir,

With the highest respect,

Your obedient humble servant,

JOHN DANBY.

*Observations on this Case, by Dr. THORNTON.*

1. DID not this paralysis arise from the poison of sugar of lead? An acquaintance of Mr. Danby, who went since to the same inn, was seized with similar symptoms. Several medical men, who had no knowledge of the story,



story, have asked him, “whether his physicians did not think he had been poisoned by lead!”

2. If this was truly the case, what would be the probable effect of sea-bathing? Dr. Johnson, a young physician of rising reputation, when at Cambridge, took a dog and poisoned him with sugar of lead; he was affected with paralysis. He opened the window and door, and admitted a current of cold air, when the paralysis became *more violent*, and the animal soon expired.

3. Dr. Rowley had tried tonic medicines, as bark, steel, and bitters, in various forms; and afterwards mercury as an alterative, with the intention, as I suppose, of giving irritability to the system. What might have been the effect of a conjunction of the two means?

4. Or was it necessary to oxygenate by the lungs, the organ supposed by some solely appropriated in cold climates to that purpose? (vide Medical Extracts, page 106.) I have some grounds for suspecting this, for I left off the super-oxygenated air, and gave in the room of it, nitre and acids, but it produced so great a derangement in Mr. D’s constitution, that it was obliged to be desisted from, and I must observe, that the mercury by itself, though indicated, seemed to aggravate the disease.

5. This case affords a very striking instance of the different effects of modified air of different degrees.—When Mr. Danby inhaled as a dose, two quarts of modified air to 800 pints of atmospheric air, he generally afterwards experienced a comfortable glow, which extended, as he himself used to express it, to his fingers’ ends. But when I attempted three different times to augment the dose to three quarts of vital air to sixty pints of atmospheric air, he was, after inhaling it, seized each time with excruciating and wandering pains, and passed a feverish night, and I was obliged to return to the former dose; and I must observe, he always saw me prepare the mixture of airs, from the beginning to the end of his attendance on me. The medicines I prescribed were bark with other tonic powers; and cof-

tiveness was obviated by those cathartics in which the acid or oxygenous principle predominates.

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*Letter from Mr. COOPER.*

*Dacre-street, Westminster, July 29, 1795.*

SIR,

I WAS above nine months afflicted with hard tumours, which were very slow to suppurate, and when they did, produced only a watery discharge, and a sore, that took a long time in healing. These appeared chiefly about the mouth and throat. Previous to this, I had frequent eruptions on my face, for which I was often purged and bled, which in my opinion might have brought on the disorder I am attempting to describe to you. It soon became necessary to try every means to get rid of it, and I took a vast quantity of different medicines; but the tumours continued rather to increase in size and number, and produced a continual inconvenience to me. As the vital air alters the character of the blood, and I conceived my case arose from a broken state of the blood, I waited on Dr. Thornton, who thinking these tumours very likely to be removed by the air, wished me to make the trial. At that time several of the tumours were commencing, others were upon the point of breaking, and others again were in a state of open sore. My bowels were first cleared, and I inhaled the vital air, and took bark twice a day in powder. The effect the air had on me was, as my mother and sister observed, to make me eat more than usual. I felt uncommon spirits, and no longer complained of chilliness. The tumours that were in their first state disappeared; the others looked redder and gave me more pain, and discharged matter. But in a fortnight these also yielded to the air and disappeared, and I was cured. But what surprised me most was the change it produced in my eye-sight. My eyes for the space of fifteen years had been very weak; so weak, that I was never able to



to read or write by candle light ; but from inhaling the vital air, they have acquired such strength, that latterly I have sat up writing in my books, sometimes from twelve to one o'clock, without feeling my sight the least fatigued. My mother used to attribute my weakness of sight to my having had the measles very bad. I am at the present time very well, and without any fear of my former afflicting disorder.

I am, Sir, with the greatest respect, &c.

HENRY FREDERICK COOPER.

*To Dr. Beddoes.*

*Observations on this Case, by DR. THORNTON.*

1. This cure was established in Nov. 1793, when it was my custom in breaking the balance of the constituent parts of the air, to incline more to the side of the vital air, and the patient inhaled daily 300 pints of common air, super-oxygenated by four quarts of vital air.

2. Scrophulous tumours you have conjectured to arise "from a deficiency of oxygene, occasioning inirritability in the system." Was not this indicated by the blueness of Mr. Cooper's countenance; the slowness of his pulse; the torpor of the tumours; and the weakness of his sight, incapable of supporting the stimulus of a strong light; for these disappeared in proportion as his system became oxygenated, and the fibres strengthened?

3. Having twice stimulated the several tumours with a solution of the oxyd of mercury, so as to produce some external inflammation, are we not to attribute some part of *their* cure to that process?

R. I. T.

4. It is hardly necessary to point out to the reader, the inference deducible from this important communication with respect to the use of vital air in a well-known species of ophthalmia.

T. B.



*Letter from Miss STEPHENS.*

SIR,

*August 6, 1795. Snow-Hill.*

A YOUNG LADY, an acquaintance of mine, aged 20, having been two years ill, and under Dr. Carr, an eminent physician, at Northampton, but continuing in the same state, she was sent on a visit to me, in order that she might obtain the opinion of some physician in London. Having had the pleasure to see the greatest benefit derived by a young lady, whose case was somewhat similar, from the inhalation of the vital air, I was very anxious for her to make trial of the same means. The countenance of Miss S—— was pale in the extreme; her lips very white; her breathing short; she was incapable of the smallest exercise; so wearied was she in dressing herself, that even during this trifling exertion, she was obliged repeatedly to lie down; her appetite was very indifferent; her spirits low; she constantly complained of cold; and towards evening her legs used to swell. When we first went to Dr. Thornton's we were obliged to take a coach there and back, and even the getting out and in, and going up stairs seemed too much for her. At the end of five days, the change in her strength was so great, that she was able to walk back from Great Russel-street, and in getting up stairs, instead of panting for breath at every four or five steps, she could ascend the whole flight with the greatest speed and ease. Her appetite was good; her spirits raised; her countenance shewed the signs of returning health; and her lips, cheeks, and nails assumed a faint blush, which continued increasing, until she was in every particular restored to perfect health, and could walk to and back from Great Russel-street, above three miles, with the utmost ease. When Miss S——, after staying with me five weeks, returned to her friends, every one was astonished at the great alteration; and indeed she hardly appeared the same young woman.

I am, Sir,

Your obedient humble Servant,

CAROLINE STEPHENS.

*To Dr. Beddoes.*

*Obser-*



*Observations on this Case by Dr. THORNTON.*

1. Did not the pallid countenance ; the white lip and tongue ; the dyspnœa when in action ; the semipellucid and polished skin ; the want of perspiration ; the black and pearly eye , the coldness of the frame ; the dyspepsia ; the yellow appearance of the teeth ; the lowness of spirits ; the weak and quick pulse ; denote a deficiency of oxygene in the system ?

2. If the skin was torn (before the system was oxygenated) there would ooze from the scratch, not blood, but a yellow serum. Is not the predominance of this fluid the cause of that sallowness of the countenance so frequently mistaken for a disease of the liver, whence these persons have the name of *bilious* ?

3. As this young lady had been under such excellent hands, may we not conclude the steel and aloetic cathartics inadequate to the alteration here produced ? In other instances the vital air along with these, has succeeded, when either *alone* did not produce the desired effect.

4. In several instances, when the blood has been oxygenated, and the system strengthened, I have employed *electricity* with the speediest effect. In such cases I have not had occasion for aloes or steel to remove the *emansio mensium*.

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*The case of Dr. CRAWFORD, Physician to St. Thomas's Hospital.*

*To Dr. Beddoes.*

*Bennet-street, St. James's, Aug. 20, 1795.*

DEAR SIR,

AS every incident respecting a character of such celebrity as Dr. Crawford, must interest the public at the present moment, I am happy that the conversations which passed betwixt him and me, were held in the presence of others. Having related to him some cures per-

formed by a *reduced atmosphere*, (which I propose at some future time detailing at length) I next represented my own situation, and attributed my recovery from phthisis 1st. to my breathing an atmosphere with a diminished proportion of oxygene; 2dly, to my exhausting that principle by continued exercise on horseback, as well as from the quality of my food; and 3dly, to my increasing the powers of the absorbents by the vertiginous motion on ship board, and now and then by a nauseating emetic.

I mentioned also my freedom from complaints in my chest, while, in the moist air of Cambridge, and that having not long back gone to Oxford, to see some friends at the University, I was almost immediately affected with pains under the sternum, and had other marks of pulmonary affection. "You are right," Dr. Crawford exclaimed with an emphasis I shall never forget, so contrary was it to his mild character. "I was obliged to remove from the sharp air of Kentish-town, which I am certain did me harm, to the softer air of Somers-town: but in my case there are counteracting causes, and my stomach and bowels are in so weak a condition, that I fear I shall not be able to give your air a fair trial. Nevertheless, I am fully persuaded of the theory suggested by Dr. Beddoes, and I have endeavoured to make its importance be attended to by the faculty; and if the hydro-carbonate does not succeed with me, it will be understood why those who have weak digestive organs stand a poor chance in pulmonary complaints, which is a still further corroboration of the justness of the theory." We discoursed then on the theory of the hydro-carbonate, and he was of opinion with you, "that as this factitious gas produced a far greater effect on the animal œconomy, than either inflammable or azotic gasses, its action could not be solely the exclusion of oxygene from the blood, but that the carbon combined with the small portion of oxygene already there, and formed with it fixed air." Having prepared the hydro-carbonate



nate according to the direction of this able chemist, Dr. Crawford inhaled after dark nearly a quart diluted with 500 pints of common air. He declared "that it transfused over his body at the time a *soothing tranquillity*, such as opium is known to produce, but with slight vertigo." The following day he mentioned to me and Mr. Hill the circumstance of the *correction* of the offensiveness of his expectoration, which he said, "he wholly attributed to the hydro-carbonate air, as he had often taken myrrh and quassia without this effect." Dr. Crawford omitted the laudanum at night, which he had been accustomed to take to check a diarrhoea, which disorder unfortunately recurring, he was defeated in his hopes of the hydro-carbonate supplying with him the use of opium. He however inhaled a second and third time the modified air, soon after which he went to Lymington, "with a fever," as he told me. "on his spirits," and there in a few months this great and good man paid the debt to nature. Nearly about the same time I was requested to go to Southampton, to attend Mr. Adams, the optician, who laboured under a similar disease of the chest; so reasonable are the suggestions, which the new chemistry has introduced into minds nurtured in philosophy. I have only to regret, that my medical engagements in London, were such, as prevented my making in these interesting cases a full trial of the aerial practice.

I am, &c.

R. I. THORNTON.

AT the time of Dr. C.'s inhalation of hdc. I received an account corresponding with the above; but had no idea of putting it into print, supposing that three quarts of hdc. taken at three different times, in a case of consumption, were much the same as if none had been taken. It is only in compliment to rumour, that I now publish a fact so totally irrevelant.

T. B.

ADDITI-

## ADDITIONAL CASE.

*Birmingham, Oct. 9, 1795.**Letter from Mr. BARR, to Dr. BEDDOES.*

DEAR SIR,

I ANNOUNCE to you with much pleasure the cure of a case of hydrothorax, which had existed for a considerable time, and notwithstanding the application of every known and approved remedy, had reduced the subject of it nearly to the last stage of human suffering.

Mr. Barbor, of Barton-under-Needwood, being in this town on a visit to a friend in the spring of 1793, was seized with an highly inflammatory fever, attended with a violent pain in the side. This fever was followed by a dry tickling cough, a sense of tightness in breathing, much languor, and a great degree of restlessness and anxiety. His bowels felt full, tense, and uneasy; his pulse intermitted; and he complained that his urine, though nearly in the usual quantity, did not flow freely, and that he had always the sensation of not having evacuated the whole. Blisters, boluses of triturated mercury, and a decoction first of Peruvian, and afterwards of Augustura bark were prescribed. He was relieved by these medicines, but he neither recovered his strength nor his spirits. In this situation nearly he passed the remainder of the year in the country; in the spring of 1794, he came to Birmingham again, with all the symptoms of his disorder very much increased, particularly the oppression in breathing. He could neither lie down in bed with comfort, nor ascend the smallest acclivity without great uneasiness. His urine was diminished in quantity and voided with difficulty. A decoction of Seneka root and small doses of Digitalis were directed and continued for two or three weeks; but they rather seemed to amuse than to relieve him. He called on me again in April last, and told me that all medicines had lost the power of relieving him; that  
his



his breathing was more generally difficult ; that his urine was very scanty, and that his appetite was entirely gone. I prescribed the Digitalis and a bitter infusion for him. He went into the country and continued these medicines for some time. Towards the end of July he called upon me again—but, alas ! how changed ! His face was now become pale and emaciated, his eyes stared as if taking a last conscious view of their objects ; this circumstance alarmed his friends exceedingly.—His legs were swelled to such a degree that the skin was become much inflamed, and in danger of bursting ; he had a continued tenesmus, and made very little urine : he could not endure a horizontal posture for a moment, but was under the necessity of being bolstered upright in bed through the night ; even then he slept little, and that little was disturbed and unrefreshing, for he frequently started from his sleep under an impression of instant suffocation.

I had then seen a proof sheet of your appendix, containing an account of the happy relief Sir William Chambers had experienced from oxygene in a similar situation ; I mentioned it to my patient, and advised the adoption of the pneumatic plan. I did this, I confess, with little hope of advantage, but as the most powerful medicines had produced no salutary effect, I felt it my duty to him, as well as to the cause of humanity, to urge his compliance. I procured him a reading of the case, and the similarity of the circumstances was so striking, that he agreed to come to Birmingham, and place himself under my care.

He arrived here on the 12th of August, and began to inspire the factitious air on the 13th. I directed one quart of oxygene mixed with nineteen of atmospheric air, to be inhaled every day ; but as the symptoms were become extremely urgent, I thought it right to join the use of those active medicines that I had prescribed for him before. Accordingly I directed him to take half a grain of Digitalis in substance, every evening, and four ounces of a decoction of Augustura bark in the  
course



course of each day. On the third night after inspiring he found himself more composed, he could remain longer in one posture, and the startings during sleep, seemed both less frequent and less violent. Every night he was sensible of amendment; in ten days he could bear the removal of several of the pillows that bolstered him up in bed; and he could sleep for three or four hours without one starting fit. The swellings of his legs too began now to subside; the tenesmus was entirely removed; the quantity of urine was much increased, and he could walk up stairs with much ease; his appetite and cheerfulness began to return, and the pale face of disease to give place to the florid countenance of health. In the course of the second week I had gradually increased the quantity of oxygene to two quarts a day, diluted as before. In four weeks from his beginning to inspire the vital air, not a vestige of the disorder remained, except weakness; he could lay his head as low in bed as when in perfect health, and sleep the whole night; no swelling of the legs remained, no difficulty of breathing upon ordinary exertion, and every function was performed with regularity and ease. He then went home provided with oxygene, and directions how to use it, and laid aside the use of all medicines except a laxative pill occasionally. He passed through this town yesterday in perfect health. His strength, agility, and vivacity are greater than in most men at his age (60).

This case, in my opinion, will add to the credit of pneumatic medicine; for though I employed medicines along with the oxygene, yet let it be remembered that the same remedies had been repeatedly taken without advantage, and before the disorder had made such alarming progress; add to this, that during the intermediate periods of the little history which I have given, Mr. Barbor had consulted some of the ablest and most experienced physicians of the present age, and faithfully followed their directions without any material benefit. May we not therefore conclude, that the art of  
medicine



medicine had exhausted all its resources without effect, and that this gentleman had remained a devoted victim, had not this new foe to disease stretched forth her benevolent hand, and snatched him from misery and death. This is the opinion of the worthy gentleman himself, of his family and friends, who have witnessed the whole proceedings. They have desired me to make it known to others, that those in similar circumstances of distress may be encouraged to hope for ease and health.

I am, dear Sir,

Your's very respectfully,

JOHN BARR.

Some observations are also offered in favour of yeast in fevers. On this subject we have the following remarks by Dr. R. Pearson of Birmingham: ' So much has lately been said in favour of yeast, as a remedy in typhus and other disorders, that I have been induced to take some notice of it. Those who have written about it, do not seem to have understood its nature thoroughly. They have looked only to the carbonic acid which it contains, without being aware of another active ingredient in its composition; I mean the *bitter principle of the hop*, which is present in a very concentrated state in yeast, and is highly narcotic. It is to this principle that I ascribe the violent effects which I have known yeast to produce when given internally. I have been witness to its operation in two cases. Neither of them were fevers. In the first, the vomitings (which had come on before) were increased by it; and in the other instance it purged violently. In respect to its use *internally*, I cannot help looking upon it as a very doubtful remedy; but I can bear testimony to its good effects *externally*, in cutaneous affections. It should be observed that there is a great difference between *old* and *new* yeast. By keeping, much of the carbonic acid air escapes, the mass becomes less frothy, and its parts are brought into closer contact; hence old yeast is, bulk for bulk, much stronger than the new. I suspect, too, that

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in proportion as it loses its carbonic acid air, it becomes more powerfully narcotic. It is therefore a necessary precaution to proportion the dose according to the quality of the yeast. The old is at least twice as strong as the new.'

At the end of the work is given a table of the cases in which factitious airs have been employed. Under the head of 'AMAUROSIS and SENSES impaired,' it appears, that of six cases, three had received benefit, which in one was not permanent. Of the remaining cases no result is given. In these cases oxygen air was administered. On the subject of ANASARCA, general, and of the lungs, and ASCITES, two cases were cured, one received some benefit, two not cured.

Of eleven cases of ASTHMA and DYSPNŒA six were cured by the exhibition of oxygen, two were relieved by the same, one relieved by one-third hydrogen, and one by hydro-carbonate. Chlorosis and sensibility increased with irritability (or contractility) diminished; of nine cases where oxygen was administered, five were cured, and four relieved.

Of five cases of DYSPEPSIA, two were cured by oxygen; one relieved. Of two cases of EPILEPSY where oxygen was exhibited, one was aggravated, the other not cured. Of HYPOCHONDRIASIS, two of three cases were cured; one relieved. Of three cases of PALSY, two were cured; one relieved:—the last case arose from lead.

PHTHISICAL CACHEXY, and PHTHISIS. Of twelve cases, two were cured by hydro-carbonate, one by carbonic acid, and one by hydrogen.

PNEUMONIA, CROUP, and CATARRH. Of four cases of pneumonia, three were cured; two by hydrogen, and one by yeast. One case of croup cured by diluted azotic air. One case of catarrh cured by hydrogen, one by hydro-carbonate, and one by æther vapour.

Of two cases of TYPHUS, one was cured by oxygen, and one by yeast.



ULCERS CANCEROUS, FOUL, STRUMOUS. Two cases of cancer were relieved by carbonic acid; five cases of foul ulcers were cured by oxygen; three cases of strumous and scrophulous tumors and ulcers cured by the ferrel poultice; and some cases of carbuncular and schirrous tumors by the charcoal poultice.

Of most of these cases it is to be observed, that such other remedies, and those the most powerful, were adopted, during the treatment with the gasses, as appeared to be indicated by the disease. Hence it becomes exceedingly difficult to determine the powers of the new mode of practice.

ART. LXXXI. *Practical Observations on the Treatment of Strictures of the Urethra.* By EVERARD HOME, Surgeon to St. George's Hospital. 8vo. 199 pages. price 3s. Nicol, London. 1795.

**D**ISEASES of the urethra form an important and difficult part of modern surgery. In the works of Mr. Hunter we have a detail of the symptoms and appearances in the different stages of strictures. Where the stricture was impervious, or nearly so, he was led from the nature of the obstruction, to see the inefficacy of the bougie; he therefore considered himself warranted in resorting to other means, and had recourse to the application of lunar caustic. This mode of treatment he found, upon trial, capable of destroying the stricture, without doing any material mischief to the urethra. The chief object of Mr. Home, in the present publication, is to apply the same mode of treatment in strictures less advanced, but which a bougie is often found insufficient permanently to remove.

The first section treats of the nature of the membrane, in which strictures are formed, proving that it is capable of contracting when irritated, by a power similar to muscular contraction.

Sect.

*Sect. 2. Of Spasmodic Stricture.* Although no part of the urethra, Mr. Home observes, from the orifice at the glans penis to the prostate gland, is exempt from the disease, it is by no means equally frequent in every part of the canal. Strictures occur more commonly near the bulb of the urethra; the situation next in order of frequency is about three inches from the orifice of the glans; they do occur sometimes almost close to the external orifice, and are even met with in the membranous part, near the prostate gland: but these must be considered by no means as common cases.

When once a stricture is formed in any part of the canal it produces two effects; it renders the membrane of the urethra in general more irritable; and it prevents all that portion of the canal, between the stricture already formed, and the external orifice, from being dilated to its usual extent; and consequently deprives it of its natural healthy actions. Under these circumstances this part is more than any other liable to the disease.

This is so perfectly true, that where the original stricture is near the bulb, and is of long standing, there is almost always another formed about three inches from the external orifice; and therefore, whenever a stricture is met with in this last situation, if the symptoms have been of some years continuance, there is reason to consider it as only the consequence of one which has been formed nearer the bladder.

Strictures resemble other spasmodic diseases, in being much more frequent in warm than in cold climates. They are met with in the East and West Indies, in a much greater proportion than in Europe; although gonorrhæa in those countries is far from being severe.

*Sect. 3. Of permanent Strictures.* A permanent stricture is nothing more than the spasmodic stricture, described in the last section, in a more advanced stage, where the contraction has so established itself, that at all times the seat of the stricture is narrower than the rest of the canal. It still, however, possesses the power  
of



of contracting and relaxing ; in the contracted state, entirely closing up the passage ; in the relaxed state, allowing the urine to pass through it in a small stream.

In this state of things, the spasmodic contraction, upon any irritation being applied to the part, is very great ; and acts with considerable force. This is known by passing a small bougie through the stricture, which in its relaxed state offered no resistance ; but after a few minutes not unfrequently contracts upon the bougie, and grasps it, making so much resistance, that when it is attempted to be withdrawn, some force is required to overcome it. The bougie when examined has an indented mark upon its surface, exactly resembling the impression of a piece of thin packthread tied round it.

When a stricture in this stage is examined in the dead body, it has the appearance of a membranous septum crossing the canal, with an orifice in the centre ; the membrane itself being not thicker at the edge of the orifice, than common writing paper. It sometimes happens that the contraction is not equally all round, but more on one side than the other, and the orifice not exactly in the middle ; in other respects the appearance is the same.

A stricture in this state impedes the passage of the urine in a degree, every time an attempt is made to evacuate it, and the force with which the urine is impelled against the stricture by the action of the bladder, is also increased according to the resistance ; producing irritation in the stricture, and giving it a stronger disposition to contract ; so that in this way the canal is in time rendered entirely impervious at that part.

For the treatment of all those cases where a bougie can be passed, these alone are in common practice had recourse to. They often fail however of producing a permanent cure, and sometimes even any alleviation of the disease. When the stricture to be removed is of some years standing, as must be always the case when it has originated in the East-Indies, it does not admit of being readily dilated, nor does it bear, for any length



of time, the application of the bougie ; and any attempt to render the dilation more rapid, or to continue the use of the bougie, beyond the time in which it lies quiet in the urethra, brings on symptoms of an irritable urethra, such as spasm, strangury, and abscess in perinæo. In these cases the bougie will not do more than prevent the increase of the complaint, since it cannot be persevered in so as to effect a cure.

Where there are several strictures in the same urethra, we have sufficient evidence that there must be more than common irritability in the membrane lining the canal, which is a circumstance unfavourable to the use of the bougie ; and in such cases we find the common bougie cannot be retained even for a few minutes ; while those of a milder nature, can be kept in without pain for an hour. Bougies which have preparations of lead in their composition, have an advantage here ; but when made of wax and oil simply, they answer better than when made of harder materials.

In such cases the number of strictures, and the irritability of the passage, make it almost impossible to succeed in dilating the whole of the canal with the bougie ; the time required to overcome all the obstructions, being longer than the passage can admit of its application, without being irritated by it ; and till the last stricture, or that nearest the bladder, is acted on, there can be little abatement of the symptoms.

In consequence of these different disadvantages, strictures of long standing become very unfavourable for the use of the bougie, and are only palliated by it, not cured. By perseverance for months, a bougie, about one half the size of the canal, is made to pass easily into the bladder ; but all attempts to introduce one of a larger size are vain. The patient in this state makes water without difficulty ; but if the bougie is left off, in less than two months, the contraction, which had never been wholly removed, begins to increase, and requires again to be dilated.



In cases such as these Mr. Home recommends the use of the caustic, which he has often found effectual in removing both the stricture itself, and the disposition to return. The mode of applying the caustic, by means of a silver canula, as at first advised by Mr. Hunter, is liable to several objections. The silver canula could not be adapted to the flexible canal of the urethra, through which it was to pass; when, therefore, the caustic was applied, and any degree of pressure made use of, the effect of the caustic was necessarily produced upon the angle, between the stricture and the side of the urethra, and not in the middle of the stricture, the part intended to be destroyed. In consequence of its being thus applied, the side of the urethra was liable to be injured; and where that did not happen, the orifice made in the stricture was often made obliquely, and could not always be followed by a bougie; so that the effect of the caustic was only to be judged of, by the increased stream of urine, as the bougie could not pass, either to ascertain the size of the aperture, to enlarge it, or prevent it from again contracting. The unyielding materials of the canula were attended with another disadvantage; for in many urethras, those particularly which require the application of the caustic, the internal membrane is so irritable, as not to admit a hard body passing along it without inducing spasm, while a softer substance gives no uneasiness; the silver canula was often prevented, by the degree of irritation it produced, from reaching the seat of the stricture; and sometimes when it had been carried down to it, was not allowed to remain there; so that a doubt very often occurred, whether the caustic was really applied to the stricture or not.

These objections to the use of the silver canula, could not escape Mr. Hunter's penetration. He not only saw them, but devised a mode by which they may be avoided, and the application of the caustic rendered much more simple; at the same time that it is directed with great accuracy to the centre of the stricture.



This improved mode of applying the caustic is thus managed: take a bougie, of a size that can be readily passed down to the stricture, and insert a small piece of lunar caustic into the end of it, letting the caustic be even with the surface, but surrounded every where laterally by the substance of the bougie. This should be done some little time before it is required to be used; for the materials of which the bougie is composed, become warm and soft by being handled, in inserting the caustic; and therefore the hold the bougie has of the caustic is rendered more secure, after it has been allowed to cool and harden. This bougie so prepared, is to be oiled and made ready for use; but previous to passing it, a common bougie of the same size is to be introduced down to the stricture, to clear the canal, and to measure exactly the distance of the stricture from the external orifice; this distance being marked upon the armed bougie, it is to be passed down to the stricture, immediately upon the other being withdrawn. In its passage the caustic is scarcely allowed to come in contact with any part of the membrane, the point of the bougie, of which it forms the central part, always moving in the middle line of the canal; and indeed the quickness with which it is conveyed to the stricture, prevents any injury to the membrane, where it is accidentally brought to oppose it. In this mode the caustic is passed down with little or no irritation to the lining of the urethra; it is applied in the most advantageous manner to the stricture, and can be retained in that situation, the necessary time to produce its effects.

This method Mr. Hunter adopted several years before his death, in preference to that which is published in his work; and Mr. Home has continued to make use of it ever since, nor has he in any case found it attended with disadvantage. He has mentioned it publicly, for these last two years in his lectures, and explained the manner of passing it.

By this mode of arming the bougie, strictures in the membranous part of the urethra may have the caustic applied



applied to them, which cannot be done by a silver canula, unless made flexible ; and even in that state it is liable to many objections.

Mr. Home's observations are made, he says, with a view to extend the use of the caustic to a greater variety of cases, and, in some measure, upon a different principle, from that upon which it has been applied to imperious strictures by Mr. Hunter; having met with a number of facts, from which a general principle appears to be established, that the irritable state of a stricture is kept up, and even increased, by the use of the bougie, but lessened and entirely destroyed by the application of lunar caustic. Hence he recommends the use of the caustic, in many cases of spasmodic stricture, in preference to the bougie.

Sect. 4th. *To shew that spasmodic affections in general are brought on by slight irritations, and not such as are violent.* This is illustrated by what takes place in gun-shot wounds, where a slough is formed, no more inflammation being produced than is sufficient for its separation ; by the effect of caustic on the tunica conjunctiva, which does not produce general inflammation on that surface, and by what takes place in spasmodic affections succeeding slight wounds of the extremities.

Sect. 5th. *Of the comparative effects of the bougie and caustic.* From what the author has seen, he thinks we may safely infer that the caustic is a mode of cure more extensively useful, milder, quicker, more effectual, and more permanent than the bougie.

The author, in the last place, comes to explain the effects of the caustic on strictures by the adduction of cases ; but first mentions some general directions for applying it, and the immediate effects it produces on the parts.

In arming a bougie, it will be attended with some difficulty to get the piece of caustic of a proper shape and size for the purpose, unless it is cast in a small cylindrical mould. In this state it is to be procured from Mr. Savigny, instrument maker, in King-street, Co-



vent-garden ; and if these pieces are thicker than the bougie can readily inclose, by putting them in water, the outside quickly dissolves, so as to diminish their size as much as is required. The piece of caustic so prepared, is to be cut into small portions, about the tenth of an inch in length, and an orifice being made in the end of a bougie, by the point of a dressing probe, the caustic is to be inserted into it, and the bougie rolled, so as to be made quite smooth ; taking care that the edge of the caustic is every where covered, and only the surface at the end exposed. After the bougie has been thus prepared, the distance of the stricture, from the external orifice, is to be marked upon it, and the passage cleared by a bougie, fully as large as that which is armed. It is then to be introduced into the passage, and applied to the stricture ; and when it is found in contact with the obstruction, it is to be steadily retained there, with a moderate degree of pressure at first, and less as it is longer continued, since the bougie becomes soft by remaining in the urethra, and readily bends, if the pressure is too great. The time it is to remain depends a good deal upon the sensations of the patient, and the length of time the parts have been diseased ; but on the first trial it should not be for more than a minute, as it then gives greater pain than on any future application. The pain produced by the caustic is not felt so immediately as it would be natural to expect ; the first sensation arises from the pressure of the bougie on the stricture ; a little after, there is the feeling of heat, and then the parts become painful. As soon as the caustic begins to act, the surgeon who makes the application, is made sensible of it by the smaller arteries of the parts beating with unusual violence, which is very distinctly felt by the finger and thumb that grasps the penis.

The pain that is brought on by the caustic, lasts for some time after it is withdrawn ; but this period differs in almost every patient, being sometimes extended to half an hour, and sometimes only a few minutes. The kind of pain is heat and soreness, which is not severe,  
as



as it is not accompanied by a peculiar irritation, which renders pain most insupportable, and is too often brought on by dilating strictures with the bougie. After the caustic has been withdrawn, it is desirable that the patient should make water, as in that way any remains of the dissolved caustic are washed off; but it sometimes happens that no water will flow at the first effort. When that is the case, it should not be urged, as it is not of any great consequence. It happens not unfrequently, that at the first time of making water, some blood passes along with it; this is also of no bad consequence, but is rather favourable; as when that has happened, the stricture usually proves to be so far destroyed, that at the next trial the bougie passes on to the bladder. Every other day, appears in general to be as often as it is prudent to apply the caustic. I have, however, done it every day in very obstinate cases, without any detriment.

In cases where, from long continuance of the stricture, there is so much induration that the caustic does not succeed; which sometimes happens; after ten or twelve applications the parts become so much accustomed to it, that it gives little or no sensation at the time it is used, but afterwards produces the same kind of irritation and irregular contractions in the urethra, that arise from too long a perseverance in the use of the common bougie; and whenever this takes place, I believe it should be for a time left off. This, however, is less applicable to strictures that admit of a bougie passing on to the bladder, than to those of a worse kind, which are become so contracted, that a bougie of the smallest size cannot pass.

In cases of stricture, attacks of inflammation frequently come upon the passage after connection with women, and are mistaken for gonorrhœa. What tends in a great measure to confirm this mistake, is the circumstance of the greatest pain being felt near the orifice at the glans penis, and not in the seat of the stricture, where it would be natural to expect it. This must arise



from that part of the canal being more sensible than the rest, so that when the inflammation extends over the whole, the feelings of this part are the most acute. In this state of the parts, when the true nature of the disease is discovered, the caustic should not be applied, for the pain is infinitely greater than at other times, is of longer continuance, and seems considerably to aggravate the inflammation along the canal. It does not, however, bring on spasm or suppression of urine. It is more prudent to defer the application of caustic till the inflammation subsides, which it generally does in a few days.

The cases are divided into those which admit of being removed in a short time: those that are not in a favourable state for the application of the caustic—and those which require a longer continuance of its use, to complete the cure. From each of these classes we shall select. The whole number of cases given is twenty-five.

CASE VI.—A gentleman who had been some years in China, upon his return to England, had connection with a woman, and was supposed to have caught a gonorrhœa; but the symptoms were not removed by the usual means, and were afterwards discovered to arise from a stricture. Upon having recourse to the bougie, the urethra was found to be extremely irritable, so much so that an abscess formed in perinæo, while under that course; this on leaving off the bougie got well; and by returning to it again, the stricture, which was about three inches from the orifice at the glans penis, was dilated; but after its use had been continued for many months, it could not remain in the canal without giving very unpleasant sensations. On attempting to pass the bougie on to the bladder, another stricture was met with at the bulb of the urethra, which allowed a small bougie to pass, but did not admit of the necessary pressure for its dilatation. So very irritable was the canal, that the surgeon, after having proceeded thus far, rather chose to leave the second stricture, than run the risk of bringing on irritation by continuing the use of the bougie.



In this state I saw him, and proposed the application of the caustic, both with a view to enlarge the second stricture, and make it less liable to return. I explained to him at the same time, that I regarded this stricture as the original disease, and that which had been dilated only as a consequence of it. He said, he had no objection to try the caustic, but had great apprehensions that it would not succeed, from the uncommon degree of irritability of the membrane of the urethra, which his former surgeon, a man of eminence, declared to be greater than he had ever met with.

On the twenty-fifth of May, 1795, I applied the caustic to the second stricture, the pain felt at the time was unattended by irritation, and was by no means so severe as he had formerly experienced in retaining in the passage a bougie, that had gone through the first stricture; it did not, however, go off for several hours after the caustic was withdrawn; a heat and uneasiness remaining in the canal during that period. On the twenty-seventh the caustic was applied again; and while I was pressing it against the stricture, the end of the bougie went through it, which made it necessary to withdraw the caustic; there was a slight degree of pain in the passage all day, and a little blood was discharged; on the following day, when he made water, there was a tinge of blood upon his linen; but not the smallest degree of irritation. On the twenty-ninth a full-sized bougie passed into the bladder without difficulty, gave no pain, and produced no irritation; it was allowed to remain a few minutes, and was then withdrawn. The next day he passed the same bougie himself with equal ease, and immediately withdrew it. He was advised to do the same for seven days, to keep the parts in that state till they had perfectly recovered themselves.

I saw him after this, and he told me, that he was perfectly well, and felt now the truth of the remarks which I had made to him; for before the caustic was applied, he had been subject to erections in his sleep, attended with uneasiness, and sensations about the bladder, which  
he



he then supposed to be natural, as he had been long accustomed to them; but these were now entirely removed, and passed his water more quickly than before, and without the usual degree of straining towards the latter part of the time.

On the eleventh of July he caught a severe cold, which brought on an irritation upon the bladder and urethra, and the stream of urine was very much diminished; this alarmed him a good deal: but it proved to be only a temporary complaint, for the same sized bougie passed readily into the bladder, and these symptoms disappeared as soon as the effects of the cold were removed.

In this case the bladder had been so long under the necessity of using force in expelling the urine, that it took some time to adapt its action to the enlarged state of the urethra. When the patient had the desire to make water, the bladder acted so powerfully, that the urethra dilated, being unable to resist its action, and restrain the urine; this put him to the inconvenience of voiding it at a very short warning; the water was by these means so quickly expelled, that the bladder from habit continued to act for some time after it was emptied, and this contraction upon itself produced a degree of uneasiness. These symptoms in a few weeks went off.

CASE XVI.—A. B. a bricklayer, about forty years of age, came into St. George's hospital in August, 1795, with a stricture in the urethra, several fistulous orifices in the perinæum, and one upon the under surface of the penis, before the scrotum: through these openings the urine passed, hardly any being voided by the natural orifice.

He gave the following history of his complaints: eighteen years ago he fell from the top of a chimney, and pitched upon the ridge of the house, with his legs astride; by which means the scrotum and perinæum were much injured. These parts recovered themselves without proceeding to suppuration.

Ever since that time he had difficulty in passing his urine, and twelve weeks since, after having undergone considerable



considerable fatigue, an abscess formed in perinæo, and burst, discharging blood and urine. Three weeks after another abscess formed, which opened externally before the scrotum; this also gave a passage to the urine; and when the urine insinuated itself into these sinuses, the pain was excruciating.

When he came into the hospital, he made water every ten minutes through the fistulæ, had a considerable degree of straining in the bladder, and tenesmus in the rectum. The external skin of the scrotum and its neighbourhood, was excoriated by the urine.

On passing a bougie, it met with no difficulty till it reached nearly to the bulb of the urethra, and there it stopped. The caustic was applied to this stricture, after which he had less irritation in the bladder; this was repeated, and the stricture gave way, allowing the bougie to go an inch further, where it was again obstructed; to this second stricture the caustic was five times used, and a full sized bougie was passed into the bladder; but before this was effected the symptoms were very much abated.

The number of fistulous orifices, and the readiness with which the urine got into them, made it necessary to introduce into the bladder a flexible gum catheter, which was retained in the urethra, and the urine by this means prevented from getting into the fistulæ. It could not however be retained above a day or two, without giving uneasiness; it was therefore, from necessity, occasionally removed. At the end of eight weeks the fistulæ near the anus and those in perinæo were healed, that only before the scrotum continued open.

This stricture, brought on by an accident, and of eighteen years continuance, was entirely removed in fourteen days, by means of the caustic.

CASE XIX.—A gentleman, about forty years old, had a stricture; which was rendered very irritable in consequence of a connection with a young woman, and by that means first discovered.



It was proposed to destroy the stricture by caustic; and as he was going into the country, and very anxious to have it done, we did not wait till the immediate effects of the irritation and inflammation brought upon the parts were removed.

When the caustic was used, the pain it produced was unusually severe: after it had remained upon the stricture about a minute, the parts relaxed, and it went on to the bladder; upon withdrawing the bougie it was followed by a little blood; as the bougie was of a full size, and had passed through the stricture, I told him that at present nothing more was to be done; that after the pain and tenderness in the urethra had entirely gone off, he should pass a bougie for a few minutes once a day, to establish the parts in their present state. He went into the country the same day, and felt a good deal of pain from the effects of the caustic; this however in twenty-four hours went off. According to the directions he had received, in two days he attempted to pass a bougie, but was unable to effect it; a similar attempt was made on the third, fourth, and fifth day, but they were equally unsuccessful. He sent to town to know what was to be done, and was advised to remain quiet, avoiding all causes of irritation; by doing so the parts in ten days recovered themselves; and he has ever since been free from complaint.

In this case the urethra was longer of recovering itself, so as to bear the use of the bougie, than in any other instance; this, although of no material consequence, as he had made water freely all the time, is a reason why the caustic should not be employed during the presence of any temporary inflammation in the urethra.

CASE XX.—A gentleman, forty-six years of age, applied to me for the cure of gonorrhœa; but upon an inquiry into the symptoms, the disease did not appear to be clearly made out. The present symptoms were a slight discharge, with pain in making water, that was felt  
along



along the whole canal, but without tumefaction on the orifice of the urethra. In this inquiry it was found, that previous to the present attack, he had at times made water less freely than usual, was subject to general irritation, and had sometimes involuntary emissions in the night, attended with pain. When he had connection with women the semen was not always ejected, but at times passed out after the orgasm was over.

From these circumstances, I was led to believe he had a stricture; but did not venture to decide that he had not also a gonorrhœa: on passing a bougie, he felt a tenderness in the anterior part of the urethra, and at the bulb there was a stricture; this proved to be spasmodic, as a small bougie, when allowed to remain a short time, passed through; it brought on a tenderness along the canal, and increased the pain in making water, which was felt over the whole membrane, as much as in the common seat of gonorrhœa. He was only to remain in town for a few days, and I proposed applying the caustic, to destroy the stricture, which I should not have been led to do under any other circumstances; but would have waited till the present inflammation, whatever might be its cause, had subsided. I applied the caustic, and he went some miles out of town, drank wine at dinner, and got wet in his feet; all which brought on the usual symptoms of indisposition from catching cold. The pain in making water became extremely violent, a number of small sores broke out upon the prepuce, with a very unpromising appearance; for two days he had great difficulty in making water, and once had it drawn off. By taking diaphoretic medicines, and quietness, all these symptoms went off; the ulcers healed up kindly, and the pain abated. The sores disappearing, rather favoured the idea of the matter not being venereal, as they had not been infected by it. He went into the country, with directions not to return to the use of the bougie. I have heard from him since; he makes water freely, and has had no return of the former symptoms, which arose from the stricture.



In this case, the local inflammation was much heightened, and the pain aggravated to a great degree, by the effects of the caustic; its use, therefore, under these circumstances is to be avoided.

CASE XXI.—A gentleman came from Flanders, four or five years ago, to consult some of the most eminent surgeons in London respecting a stricture in the urethra, and by their direction employed the bougie, and returned home; but, from the irritability of the parts, was never able to continue its use, and his complaint increased so much upon him, as to make his life wretched. In this state I saw him in Flanders, in September 1793, at which time the smallest bougie could not pass. I applied the caustic, and in consequence of it he was able to pass a small bougie, in which I begged him to persevere. The troubles in that country brought him over to England in September 1794, and he put himself under my care. The distresses of his private affairs agitated his mind, and increased the irritability of these parts; he had several very severe attacks of an intermittent fever, a very common constitutional symptom of stricture, which reduced his strength in a very great degree. I attempted the use of the bougie, and passed a small one into the bladder; from this, however, nothing was gained, for the bougie in passing through the stricture brought on spasm and violent irritation. I adopted the caustic, and destroyed the stricture, which relieved the symptoms so much that it was supposed there were no others; but a few inches further on the canal there was a second. After touching this once or twice, I wished to proceed with the bougie; but irritation came on, and the ague returned with so much violence as to endanger his life. The caustic was again resorted to: it was applied six or seven times without bringing on irritation upon the parts, and materially relieved both the constitutional and local symptoms. Having so far succeeded, I was desirous of completing the cure by means of the caustic; for in the present state of the parts, ground was lost instead of gained by the use of the bougie. I found, how-  
ever,



ever, that little was to be expected from persevering with the caustic, for the urethra contracted before the armed bougie could reach the stricture; and even when applied to it, there was a slight degree of irritation brought on. As this was the case, and he was much indisposed, he went to Bristol, with a view to restoring his general health, as some of the symptoms in the bladder and urethra seemed to depend on its present state.

I wished him, upon leaving town, to do nothing but attend to the recovery of his strength; for, as he made water tolerably well, and with little or no irritation, nothing was immediately necessary. The frequency in making water, and at intervals, a discharge of mucus from the bladder, continued with little abatement even after he had considerably improved his health. I therefore proposed his returning to the use of the bougie; this he seemed not to think necessary, as there was no obstruction to the passage of the urine; but upon the principle I have already explained, I told him, that till the urethra was rendered much larger at the contracted parts, these symptoms would continue. He now employed the bougie again, and was able to pass one a good deal larger than the smallest size; but although this was the case many months ago, the progress by means of the bougie has been very small; nor do I believe, from the experience I have had since that time, in similar cases, that much further good can be effected by that instrument, and the cure is only to be completed by the caustic.

ART. LXXXII. *An Essay on Indigestion, and its Consequences.* By R. SQUIRREL, M. D. 8vo. 109 pages. Price 2s. 6d. Murray, London.

WITH respect to this essay, it is sufficient for us to inform our readers, that its chief purpose is to recommend a medicine, “discovered by the author for the cure of the above complaints, *established upon sixteen years extensive practice.*”

ART.



ART. LXXXIII. *Hints respecting the Chlorosis of Boarding-Schools.* By the Author of *Hints respecting the Distresses of the Poor.* 8vo. 31 pages. Price 1s. Dilly, London, 1795.

THIS pamphlet has been attributed, and we believe with justice, to the pen of Dr. Lettsom. Its object is to enforce certain regulations in boarding schools, which doubtless have much influence on the health of youth, with respect to exercise, diet, and dress. With regard to exercise the author observes, ‘ that nothing is more essential to children than exercise, and nothing has been more neglected in female boarding-schools. The same complaint cannot be applied to those for boys; but, even in the environs of London, the play-grounds for boys are too contracted, and the consequence has been an increase of disease, particularly of low remittent fevers and ulcerated sore throats. I knew a school which was seldom attended by fewer than fifty boys, and during fifty years only one of them died, although they never were removed in sickness; and this individual was a descendant of the great Penn, the founder of Pennsylvania. At this school we had a range of some miles in the country; and, during nine years that I was a pupil, we had neither sore throats, nor low remittent fevers, and I am certain not one death. Every physician in London knows, that these diseases not only visit the schools about London, but often become very fatal; perhaps a conjecture may be risked, that more fatal cases occur in one year in any one school within ten miles of London, than in that I have mentioned, for the space of fifty years.

‘ If the want of exercise may be in some instances justly urged against these schools, what loud complaints may attach to those for females! The fair object enters school about six years of age, and remains in it till about her fifteenth year. Prior to the first period, brothers and sisters enjoy their sportive exercises in a mutual degree, and are equally healthy; but, after entering



ing into their respective schools, different habits are adopted, and different degrees of health ensue. Every motion of the little female is squared by rule; the chaste attitude which nature gave is directed, or rather perverted, by iron or wooden instruments and shackles; the pleasing curve of the vertebræ of the neck, which admits of a graceful inclination of the head, and, in counterpoise with the curve of the vertebræ of the back, forms the center of action, on the centre of power, is destroyed. Sentiments respecting the delicacy of the sex constitute an apology for inducing a delicacy of constitution, as if frailty were a favourable acquisition, and bodily imbecility the source of mental happiness! Even the usual exercises of walking and dancing are not rendered, as they might be, conducive to health. A school consists of various ages; and, as the young and the elder walk together, their arms attached to their waists, the elder are compelled to measure their steps by those of the youngest, by which means their exercise is rather tedious than salutary. To prevent this inconvenience, they might be divided into classes or parties suited to age, but each individual should be allowed the free use of the arms as well as of the feet; and, when it can be permitted with propriety, the children should be left to use exercise agreeable to their own inclination, without the presence of a governess, to check hilarity. The benefit resulting from exercise does not altogether depend upon air and motion; it is dependent on the combination of mental amusement. In all situations whatever, and at all ages, this is an essential object. A gentleman, habituated to ease and luxury, will rise with the sun, undergo the most laborious exercise in hunting a stag, hare, or fox, for the space of half a day, not only without fatigue, but with benefit to health, owing to the amusement and hilarity which the mind enjoys; but, were the same gentleman compelled to go through half the exercise which afforded no amusement, his fatigue and disgust would be insupportable. This is every day the miserable experience of men, who were



once engaged in the habits of industrious trade and bustle, and whose success and wealth have encouraged and enabled them to retire from business. They find life a burthen ; and, not having a pleasing object to encourage exercise, they acquire a painful ennui, and find they have exchanged the *otia* for the *tædia vitæ*. It is here that various exercises have been suggested as *succedanea* ; but, alas ! they all fail, because they want the pleasurable zest. The dumb bell is tugged, the feet and legs are dragged along the walks and avenues of a garden, but alike uselessly. I repeat, that children should be allowed to indulge frequently in play in safe situations, without the controul of a governess's eye ; the mind being thereby unrestrained, the amusements improve health, almost in proportion as innocent hilarity is indulged.

• If females were thus occasionally left to themselves, they would invent a sufficient variety of pastimes ; in many schools I have been the means of introducing the rolling of the hoop, dancing and skipping in the rope, &c. In wet weather, the battledore and shuttlecock, hand-ball, tennis, and other amusements, may be substituted. It ought also to be a constant rule, never to suffer children to sit down, either at the needle or a book, for any length of time, but intervene a walk in the garden or play-ground. I need not add here, that, among the varieties of exercise, that on horseback is well calculated to unite motion and pleasure, when it can be conveniently procured. As to dancing, it can hardly be ranked among the salutary exercises, because it requires attention, and a degree of solicitude ; and solicitude of mind weakens the body ; besides, dancing is usually in large parties within doors, and sometimes under burning candles ; both injurious to health. Some steps have too little action to be considered as affording bodily exercise, and others are too violent, inasmuch as to have proved fatal, when sudden exposure to cold has succeeded these violent exertions ; any exercise indeed, within doors, is not so beneficial as in the open air.

• DRESS,



‘ DRESS.—When one considers the peculiar organization and structure of woman, it must become a matter of surprize, how the present dress acquired such general acquiescence\*, more especially as it counteracts personal beauty, as well as health; not only in the present but in the subsequent generations.

‘ The female, destined by nature to give life and nurture to the species, is organized in a manner suited to these important ends; and at a certain period the parts, formed to accomplish these purposes, evolve, enlarge, and acquire new powers, unless prevented by folly and fashion. The whole frame indeed is in a constant state of accretion, or growth, till at least the time of puberty, and, in a more particular manner, about this period, the chest, and lower parts.

‘ The custom of wearing stays must hence appear a monstrous appendage of female attire, as most unhappily calculated to press upon and injure the parts so essential to the health of the sex and their offspring. It is no unnatural inference to ascribe the Chlorosis, the female weakneses, perhaps even cancer and various uterine diseases, in some cases to pressure from this cause. The uterus is cramped from taking its necessary evolution and growth; and consequently pregnancy and parturition, instead of being easy changes in the constitution, become real pains and diseases.

‘ The little offspring partakes of its mother’s misery, having entailed upon it often a long state of debility, and too frequently deformity and decrepitude. The breasts, the ornament of the sex, instead of being likewise the fountain of health, afford neither a salutary nor even a plentiful nourishment to the suckling, who is hence sentenced to a stranger’s breast, or to the culinary saucepan.

‘ Impressed with sentiments, as much the result of medical science as of humanity, may I presume to address the tender parent; if too late to retrieve her own constitution, to adopt those easy means which nature points out, in favour of her offspring?

‘ At

\* This MS. was prepared for the press some years ago.

‘ At the time of printing these remarks (which were written some years since) a pleasing revolution has taken place in this department of female attire; and I hope, instead of returning to the tight stays of former times, good sense will induce the female sex to continue the present loose dress, or rather to exclude stays entirely, as not only useless but injurious.

‘ It is difficult to account for the introduction of fashions in general; but, in spite of all its prejudices, beauty, one would imagine, would be a predominant wish of the fair-sex; and to squeeze the body, or any part of it, into a disproportionate shape, must infer imperfection.

‘ Were the feet crippled and rendered too small in proportion to the leg, or the waist to the hips or shoulders, in that ratio is there a departure from beauty and perfection of figure, independent of what is still more important, health and happiness; but even admitting that beauty consists in a disproportionate thin waist, I do not imagine that tight-lacing the stays will effect it. Some of the most elegant and upright, and suitably slender waists, that I have observed, have been of those women who never wore stays, or ever were straight-laced, either when young, or after parturition.

‘ A specious argument has sometimes been urged, that stays give strength to the body. Certain it is, that when pressure has become habitual, on its removal, the body at first feels weaker; and it is well known, that some young women have accustomed themselves to such tight-lacing, as to fall into hysteric fits on being unlaced; till at length the evil has become so considerable as to compel such women to sleep in stays, in order to prevent the fits. This state of debility, however, would never have occurred, had they avoided this injurious fashion; indeed, if strength depended upon stays, it is the male, to whom strength is essential, who ought to adopt this part of dress, and not the female, in whom chastity, elegance, and refinement, rather than vigour and strength, are characteristics.’

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# GENERAL VIEW

OF THE

## PROGRESS OF MEDICINE.

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IN tracing the progress of an art so imperfect as that of medicine, it is naturally to be expected that each year should add somewhat to the general stock of acquired knowledge. Yet whoever considers the inherent difficulties of the subject, and the advances already made, will not be very sanguine in the quantum of improvement he expects to find. That industry, however, has been exerted, and the science in some degree advanced, we trust will be evinced by a retrospect of the labours of those employed in this field.

The subject which first attracts attention in the present review of medical productions, is that of animal electricity, as it has been styled. It had been long, and generally known, that common electricity was capable of producing great changes in the animal œconomy. It had been frequently observed, that persons were affected at the approach of a thunder storm, and often suffered violent agitations. Some persons are at these times seized with sickness

at stomach, purging, and sometimes vomiting. From the experiments of Messrs. Contugno, Galvani, Valli, &c. on the continent, and those of Dr. Fowler and others in our own country, much attention was excited, and great and flattering hopes were entertained of the discovery of a new law in the animal œconomy. A student, it is said, at the university of Bologna, whilst dissecting a living mouse, when he touched the intercostal nerve with his scalpel, received a considerable shock in his hand. From this and other experiments of a similar kind, it was imagined, that nature possessed the means of accumulating, and retaining electricity in some part of the body. This opinion appeared to receive much support from the analogy of the torpedo, the lamprey of the river Amazon, and the eel of Cayenne, which are known to be capable of giving the electrical shock. The analogy which is found between the effects of animal electricity, and the action of nerves on the irritable fibres of muscles, led to the supposition, that the nervous fluid, which forms the basis of the prevailing systems of physiology, is nothing else but the electric fluid. M. Valli not only attributed to electricity the power of exciting irritability, and putting muscles into action, but also of communicating to them the immense force they are found to possess.

Notwithstanding the whole train of circumstances which preceded the discovery of this new influence, as it was termed, led to the supposition of its relation to electricity, Dr. Fowler, from his repetition of the experiments before made, conceived some doubts of  
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of their identity, and was inclined to suppose it something inherent in animal life, and altogether different in its nature from the electric fluid, to which it has no relation.

Time, which commonly so effectually discrepates truth from error, seems, in the present instance, to have detected much fallacy in the experiments and conclusions of the first discoverers. The experiments of others, and those of the highest reputation for accuracy, have led them to form conclusions widely remote from those first drawn. We allude particularly to the labours of Dr. Monro on this subject. From an attentive consideration of his experiments and reasonings, we feel inclined to conclude with him, that the fluid, which, on the application of different metalline bodies to animals, occasions convulsions of their muscles, is electrical, or greatly resembles the electrical fluid: that this fluid does not operate directly on the muscular fibres, but merely by the medium of their nerves: that this and the nervous fluid or energy, are not the same, but differ essentially in their nature, and that it acts merely as a stimulus to the nervous fluid or energy; and, upon the whole, that the experiments which have been made, have merely shewn a new mode of exciting the nervous fluid or energy, without throwing any farther or direct light on its nature.\*

The application of the new chemical doctrines to the philosophy of medicine continues to be pursued

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by

\* For a particular account of the different experiments, vide pages 18, 25, and 34.

by Dr. Beddoes and his coadjutors, with unabated industry. Additional proofs are daily afforded of the great influence of factitious airs on the animal system. We are sorry, however, to observe so strong a tendency to speculation in the propagators of this doctrine. There is much reason to fear that truth will be for some time obscured, rather than developed, by the enthusiasm of this class of inquirers. That the hasty adoption of their doctrines should meet with much opposition from the faculty, was naturally to have been expected. Men accustomed to think in a certain train, imposed by education and early acquired habits, are not to be shaken in their opinions by every doctrine that wears the face of novelty. Indeed the cause of truth is in all probability much served by this very caution, which has been so much ridiculed. New doctrines have frequently been promulgated, which have worn as imposing an aspect as those of the ærial professors, which yet time and further inquiry have as frequently overturned. By this early opposition the authors of novel opinions are obliged to furnish themselves with new weapons, if such are to be found, in their defence. The acrimonious attacks therefore which have been made by this new sect, on all who, for want of conviction, withhold their assent to their conclusions, are not more repugnant to reason in themselves, than unavailable to the support of the cause they have undertaken. Had they recollected what took place at the introduction of the doctrine of the circulation, and on many other memorable occasions of discovery, they would see how little reason there was to apprehend, that their  
 opinions



opinions could be borne down by authority, without the appeal to impartial inquiry. They would have been easy under the opposition; the only effect of which would have been, to double their diligence in the search of fresh arguments, and additional proofs; knowing that on the present, as on every other occasion, truth will ultimately prevail. With respect to ourselves, it has been our care to state, in a full and fair point of view, the whole which has appeared on the subject; applauding the industry and perseverance of the authors; feeling, at the same time, the necessity of admitting with much caution the whole which has been brought forwards.

The opinion which has been adopted, and almost universally supported by the aërial sect, of attributing the excitability of animal bodies to the presence of *oxygene* in the animal fibre, making this the principle of irritability, and even of life itself, we deem to be sufficiently refuted by the able observations of Mr. Herdman, in his essay on the causes and phenomena of animal life. † Mr. Herdman, in this performance attempts to shew, and supports his opinion with much ingenious argument, that the distinction made by the late Dr. Brown, of debility into two species, the direct and indirect, differing from each other in their nature, and essentially requiring a different treatment, is without foundation. He allows that there is a material difference in the first effects produced on the body in these two cases; but, at the same time, he maintains, that they both terminate by producing a debilitated organization, which seem in

no respect to differ. That the debility induced by the action of too powerful stimuli, is accompanied with the symptoms denoting an accumulation of excitability, appears from the effects of strong liquors. When the intoxication has ceased, we uniformly find a higher susceptibility to the action of stimuli, and even of the stimulant which has produced the debility. It does not seem therefore, true, in fact, that the debility which follows the excessive use of stimulants, arises from an exhaustion of the excitability. This question is doubtless of much importance in practice, since it leads to a very different mode of treatment from what has been laid down by Dr. Brown and his followers. The natural method of removing debility, in every case, says Mr. Herdman, is by employing, in due proportion, the necessary healthful agents, particularly aliments.

The difficulty in this case appears to lie here; that Dr. Brown had an imperfect notion of the varying condition of the excitability in animal bodies, and supposed living bodies to be originally endowed with a certain quantity of this power which underwent a gradual diminution from birth to death; at least such, as Dr. Beddoes remarked, is the natural result of his principles. It is however sufficiently probable that this, as all the other powers of the body, is capable of being generated anew, especially during sleep, and perhaps in other circumstances. If this be true, it is easily conceivable that the use of stimulants may increase the excitability, although they ultimately lessen the powers of the system. Power and action seem in this case to have been confounded together.

Action



Action may be great, though the power be small, and *vice versa*. On this head, Dr. Beddoes has furnished us with some valuable observations, in the preface to his edition of Brown's elements.†

The subject of morbid poisons, a subject that has been very little investigated, has been ably taken up by Mr. Adams, who, for the most part, has confessedly borrowed his opinions from the late Mr. Hunter: upon whose fair fame, by the bye, much virulent abuse has been lavished by his well-known adversary; with no other effect, however, than that of calling his opinions further into the notice and approbation of the medical world. Morbid poisons are probably more various than has hitherto been supposed. Many of the anomalous diseases are probably of this kind, although their history, and the laws by which they are governed, have been hitherto too little attended to, to enable us to know them distinctly. It is certainly a subject of much importance, as well as great difficulty, and calls for the closest attention.

The most striking character of morbid poisons, as far as they are yet investigated, appears to be, that when a loss of substance is induced by the stimulus of the poison, whether from slough or ulceration, as soon as the diseased action ceases, instead of granulations rising to fill up the cavity, we find it immediately skinned over, and if the lost substance is restored, it is by a subsequent process under the skin. This is observed in the pustules of the small-pox, and in chancres, where the ulceration has acquired any depth;

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and

† Vide page 105 of the present volume.

and the same may be traced, Mr. Adams supposes, in all the anomalous morbid poisons.

We are led in this place to notice an opinion of Mr. Adams with respect to the nature of cancer, which is certainly original. He does not consider this disease as a glandular affection, as has been almost universally done, but as depending upon hydatids. The cysts, which have been sometimes described, though often overlooked by writers on the subject, instead of being accidental appendages to the disease, Mr. Adams supposes to constitute its true character. These hydatids he supposes to have a power of increase and growth, as in other cases. The increase of the cysts is not, he observes, towards the skin, like matter in a common abscess, but in every direction, as might be conceived to be the case if the part affected had a power of increase within itself. Another peculiarity, he remarks, is found in this disease, which is, a disposition to fungate before the skin is broken. Thus, the fungus, which has in general been considered as the disease, Mr. Adams considers as one of the circumstances merely. In short, the author supposes the simple hydatid to be the first form of carcinoma, and that probably there is no difference between the abdominal and carcinomatous hydatids, except in the slow progress of the latter, the number of their tunics, and the contents of some of them. He supposes, likewise, that the permanent success of the operation for carcinoma depends on the hydatids being confined within one common cyst, which may ensure their entire extirpation.

How



How far this doctrine will be generally received, it is difficult at present to say. That in most, if not in all cases of scirrhus tumours, on cutting into them, somewhat of an encysted appearance may be observed, is sufficiently certain; but whether this, together with other circumstances relating to their growth, increase, situation, and separation, can be admitted as sufficient ground for the opinion of their being of the nature of hydatids; will, we imagine, be much questioned. If it be admitted, it unfortunately affords no hope for greater success in the treatment of this dreadful malady. The entire extirpation could probably seldom be effected, nor is it likely we should be able to destroy them through the medium of the constitution.

On the subject of scurvy, the present year affords us some valuable observations. The comparative trials of different remedies, made by Dr. Trotter, appear to have sufficiently established the superior, and almost exclusive, advantage of the recent vegetable acid. The inutility of the sulphuric acid, the concentrated acid of tartar, nitre, the acetous acid, sugar, and spruce beer, seems, by his experiments, to be clearly ascertained. We know not how to reconcile with this, the testimony of Mr. Paterfon, in favour of what he calls the nitrous vinegar. Dr. Trotter's experience was decidedly against both nitre and vinegar, when separately exhibited; and it does not appear, that the combination of the two can, on any rational principles, afford any peculiar advantage. It is, however, altogether a question of fact, and

and we wish not to invalidate the testimony of a respectable writer by any opinion of ours. Further trials must determine the matter.

The second Tract of Dr. Fordyce, on Fevers, forms a continuation worthy of the author's former remarks on this interesting subject. Whilst the history and progress of Tertians has been accurately traced, the power of medicine for their removal has been as judiciously ascertained. When the author has completed his plan, we shall be in possession of the most perfect account of this extensive subject that has hitherto been given to the world. For many valuable remarks on a particular species of fever, to wit, the jail distemper, we are indebted to Dr. Carmichael Smyth; who, however, has attributed more to putridity than strict medical philosophy will perhaps warrant. This, however, is little more than a speculative point.

Amongst other valuable practical works of the present period, Dr. Ferriar's *Medical Histories and Reflections* merit particular notice. The method he has adopted of forming inductions from a great number and variety of cases of the same disease, is that, which, perhaps, alone is truly useful. The publication of individual observations serves little other purpose than to load the memory with false facts and unconfirmed experiments. Whilst the powers of the system are equal to the removal of so many diseases, a considerable number of instances, and those  
much



much varied, are requisite, to enable us to draw a certain conclusion in favour of any mode of practice.

It will be found, we trust, that the present year has added not inconsiderably to our stock of surgical knowledge. The discourses on the nature and cure of wounds, by Mr. J. Bell, form a work, which cannot fail to be highly instructive to students in this branch of medicine. The clearness of his descriptions, and the decided manner in which he lays down his rules, are calculated to impress the young practitioner with a proper confidence in himself; and lead him to distrust, with justice, much which has been published by mere writers of systems on this branch of the healing art.

The disease of the bones termed Necrosis, was a subject that stood much in need of elucidation, and we have no hesitation in saying it has received it in an eminent degree, from the judicious observations of Mr. Russell. In a future number we shall have occasion to notice a valuable foreign publication on the same subject.

The new method of operating in Femoral Herniæ, recommended by M. Gimbernat, is probably a material improvement in practice. Its utility however is founded solely in the accuracy of his anatomical description. If the structure of the parts concerned be precisely as he suggests, there can be no doubt as to the propriety and advantage of the mode of operation he has proposed.

Mr.

Mr. Home's Observations on Strictures in the Urethra, throw much light on a difficult and important part of surgery. The improvement he has suggested in the treatment, consists in applying the caustic in the manner recommended by Mr. Hunter, to strictures less advanced, but which a bougie is often found insufficient permanently to remove. So far as the contraction in the canal depends on the formation of a mere membranous septum crossing it, of inconsiderable thickness, the efficacy of the caustic appears to be indisputable. We know, however, that the disease sometimes consists in a general contraction of the urethra, to the extent of an inch or more ; and in such cases, the caustic would seldom be successful. But there is reason to suppose that these cases are not frequent, whilst those adduced by Mr. Home prove, that the former often exist, and are susceptible of very effectual relief from the means he has recommended.

The question with regard to the action of opium on the living system, whether it be a *stimulant* or a *sedative*, still engages the attention of practitioners. Its stimulant effects have of late been pretty generally admitted, and especially amongst the favourers of the Brunonian theory. We find Dr. Johnstone, however, in his valuable Essays, still maintaining its character as a sedative. Its power in assuaging pain, and in moderating excessive and unnatural spasmodic actions; its effects in lulling and benumbing sensation, are well known and universally



fully acknowledged. This suspense of sensation and action, according to Dr. Johnstone's idea, somewhat like sleep, gives occasion to the renewal and restoration of the vital powers, and thus becomes a remote cause of invigoration; but he would not hence infer that it possesses a directly stimulating power. If the sense of taste be appealed to, or even the ordinary sensation of the living fibres, as in applying it to raw surfaces, it would certainly appear, that the stimulus of pepper, and a hundred other substances, infinitely exceeds that of opium; in truth their effects are in no wise analagous. We therefore agree with Dr. Johnstone, when we observe, that the denominating opium a stimulant, meaning thereby to express a direct power of increasing the animal actions, does by no means convey to our minds its true character.

That in large doses it is capable of instantly arresting the living powers, without struggle and without resistance, is most certain. In lesser doses what are its effects? It sometimes occasions vomiting—it sometimes suppresses it; sometimes it lessens the irritability and activity of the alimentary canal—sometimes it has no such effect; it sometimes produces sleep—at others watchfulness; sometimes it occasions sweating—often it suppresses this evacuation; it benumbs sensation—or it renders the body acutely sensible; it sometimes occasions delirium—at others it suppresses it. And in this variety of consequences from its use, no one is necessarily prior to another; but each at times is observed as its first  
and

and immediate effect. It appears therefore, that neither the term *stimulant*, nor that of *sedative*, expresses its proper character, as indicating its immediate mode of action. It is perhaps difficult to assign it a name sufficiently expressive of its powers. Its effects undoubtedly vary with the constantly varying state of the animal; and a thorough knowledge of its medicinal qualities can only be derived from a multiplied observation of its effects in every variety of constitution, both in health and in disease.

Amongst the works of which we have given an analysis, it were easy to mention many others entitled to commendation; but our limits forbid us to be more particular.

We must not conclude our Remarks without adverting to the attempt which has lately been made to diffuse medical knowledge amongst the public;—we allude especially to the publication of *Medical Extracts*, and Mr. Townsend's *Guide to Health*. That the public are grossly ignorant on this subject, and that much evil and many abuses arise from this source, cannot be questioned. Of the propriety of removing these, likewise, by spreading medical information amongst the different classes of society, we are by no means inclined to doubt. With a subject of such particular interest to every individual, and which involves so much of his ease and comfort in life, it is incumbent on every one of liberal education to be in some measure acquainted; at least so far



far as to enable him to judge of merit in others, and to distinguish the practitioner of real abilities from the boastful and ignorant quack. It may, however, be doubted how far this end can be answered, by holding out as truth what at present is mere matter of opinion, and endeavouring to impress the public with the belief of theories as yet in their infancy, and from which the majority of cautious practitioners have deemed it hitherto prudent to withhold their assent.

The pneumatic practice, and the Brunonian theory are both of them but little understood by practitioners, and their proper limits far from being ascertained. To endeavour therefore to make the public parties in the cause, by exaggerated accounts of opposition on the one hand, and partial representations in favour of these doctrines on the other, is surely not serving the cause of truth, but calling on the prejudices of mankind in aid of opinions, which can only be fairly and fully investigated in the retired paths of science. Flattering hopes of improvement in the healing art may doubtless be entertained from the chemical discoveries of the present æra, but the degree in which they may be realized is probably as little known to the propagators of the new system, as to its opponents.

Pneumatic medicine, as to its merits, has probably been much over-rated. It appears from Dr. Ferriar's Treatise, that he has been disappointed in his expectations of the advantage to be derived from the aerial remedies, and his conclusion is not highly in  
their

their favour. In phthisis, the use of the hydrogen he has found of less advantage, than the common methods of practice, and in peripneumony it was altogether inefficacious.

The application of carbonic acid air for the cure of cancers, from which we were induced to hope so much, from the relation of the cases by Dr. Ewart,\* we are sorry to learn is not likely to be productive of lasting relief. The two patients, whose cases we have given a full account of in our former volume, we understand to have both fallen victims to this dreadful disease. A speedy recurrence of the symptoms took place, which the remedy no longer had a power of mitigating.

The unfortunate termination of these, and other cases where pneumatic remedies have been employed, ought not, however, to discourage us from further trials. But these, as Dr. Ferriar well remarks, will be undertaken with hopes much reduced, and eagerness greatly abated.

\* Vide Medical Review, Vol. I. p. 536.



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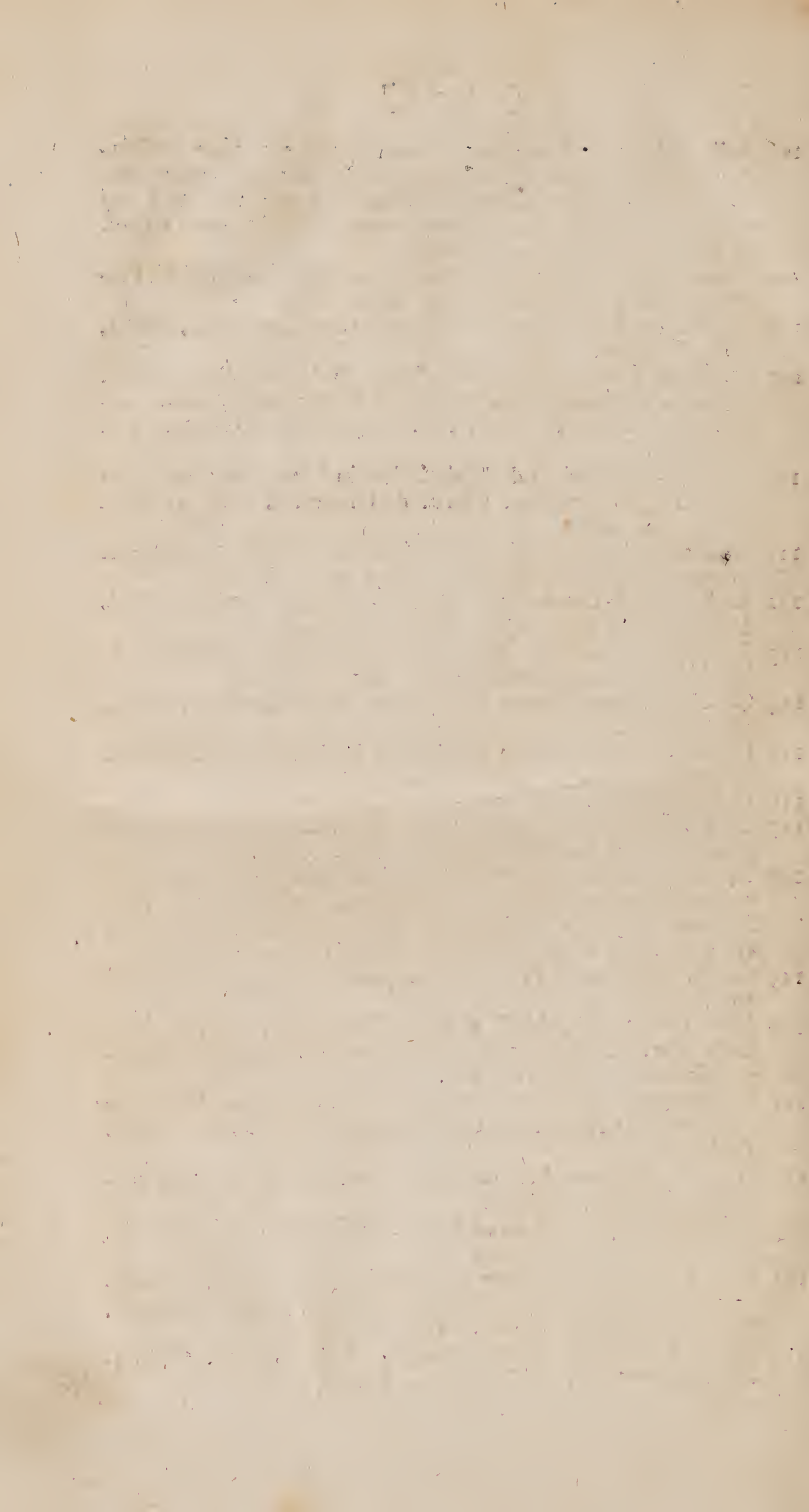


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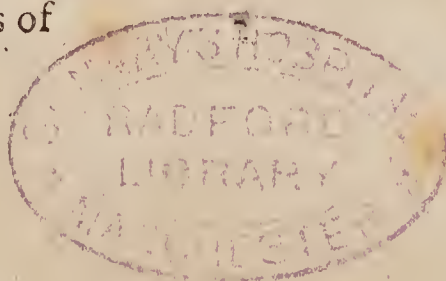


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